DECEMBER, 1955

American Engineer

IN THIS ISSUE . . .

Aerial Inspection—An Engineering Step to Peace

By

DONALD J. BELCHER, P. E.,

President, Donald J. Belcher & Associates, Inc.

. . . The acceptance of President Eisenhower's proposal by the Soviet Union would thaw fears. As the ice cap of cold war receded, men could walk forward in the sunlight of a great Age of Advancement.

—Harold E. Stassen

Professionalism in Industry: The Dow Story by H. P. Cooper, P. E.

***Last of Three Parts*: So You Want to Open a Consulting Office**

***Plus* Late Washington Report • Engineers' Week News**

NSPE Officer Nominees for 1956-57

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Season's Greetings

Lockheed diversification in action...

At right: engineers and scientists work on some of the 46 major projects in progress at Lockheed

Operations Research discussion on continental defense

Operations Research openings

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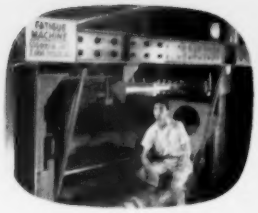

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In-flight test on air speed performance

Flight Test Engineering openings

Flight Test Engineers
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Aerodynamic meeting on high-speed fighter

Aerodynamics openings

Aerodynamics Engineers
Aerodynamicists
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DECEMBER

1955

American Engineer
21st YEAR OF PUBLICATION
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With peace as an objective, spiritual factors find a climate in which they can flourish and, to the extent that they are cultivated, the fabric of national security is built and strengthened.

—Lewis L. Strauss,
Chairman,
Atomic Energy
Commission

•

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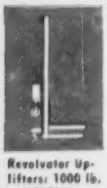

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Letters to the Editor

The NBER . . .

Dear Editor:

In reading Mr. John B. McGaughy's article in the October 1955 issue, I noted his statement that consultants operating in a number of states should be registered with the National Board of Engineering Registration.

I would appreciate further information as to qualifications and requirements for this registration and also where to apply for same.

L. E. MARTONY, JR., P.E.,
Meadville, Pa.

► For others interested, the NBER can be reached by writing the National Council of State Boards of Engineering Examiners, P.O. Drawer 1404, Columbia, S. C.—*Editor.*

Task Force Issue . . .

Dear Editor:

In the past I had the occasion to write the editor of the AMERICAN ENGINEER in behalf of the photogrammetric industry. Being a relatively small industry and with comparatively few engineers it has not received a great deal of attention in our publication.

Fortunately, photogrammetry is receiving more and more recognition in various engineering magazines as it is becoming a more important element in engineering planning.

I particularly want to thank you for giving the article on page 16 of the September 1955 issue quoting that part of the Hoover Commission Task Force Report dealing with aerial mapping and the Government competition. Although the Commission's effect in our behalf was not nearly as strong as we would like to have seen, it certainly is a step in the right direction and your publicizing it will help the overall cause.

PLINY GALE,
President,
Jack Ammann Photogrammetric Engineers, Inc.
San Antonio, Tex.

AE Cartoons . . .

Dear Editor:

May we make an observation on the cartoon entitled "About how many rooms, folks?" which appeared in the October issue of the AMERICAN ENGINEER.

Just about that state of the art has been attained by Paul M. Muspratt, P.E., member of the Northumberland Chapter, Pennsylvania SPE. Mr. Muspratt has developed a method of producing precast concrete cross-cored insulated building panels, beams, and columns that may be sawed to any desired length as the occasion demands. The utility of the product is increased by the fact that the reinforcing material may be inserted after the part has been poured. The cartoon is not as far fetched as one might imagine on first sight! . . .

WARREN D. GARMAN, P.E.,
Lewisburg, Pa.

More Emerson Comment . . .

Dear Editor:

My comments on this article ("National Defense Begins in the College," by Mr. Cherry L. Emerson, AE, August 1955) are as follows:

Mr. Emerson has done a great service in pointing out the critical role played by our institutions of higher education in the welfare and security of modern American society and, especially, the key role played by scientists and engineers. I wish all American citizens could read this statement.

However, when Mr. Emerson proposes the specific measures intended to alleviate the weaknesses in our system which he has pointed out, there are many who will have to disagree with him. What he appears to be urging is additional Federal subsidy of colleges and universities and Federal subsidies to teachers. I personally would prefer to try other measures before we travel down this road.

Mr. Emerson is correct in saying that the Federal Government should make sure it pays all of the direct and indirect costs on research contracts. The National Science Foundation has indeed recently made recommendations to the Bureau of the Budget to bring the research contract policies of all agencies of the Government to a uniform one which endeavors to pay full costs. However, the proposal to pay the colleges and universities a subsidy by large overpayments of indirect costs of research is, in my mind, wrong in principle. If a subsidy is to be given to the colleges and universities by the Government, it should be an outright subsidy and not be hidden under a fictitious "overhead" blanket.

Mr. Emerson's statement that "industry is not much interested in basic research" is rapidly becoming obsolete. A large segment of American industry has come to recognize the values of basic research as carried on in universities, and large outright grants for such research are now being made by many leading industrial corporations. The California Institute of Technology received last year over $600,000 in such grants, not including any research contracts for specific projects. This source of support for higher education and research and for the training of graduate

(*Continued on page 44*)

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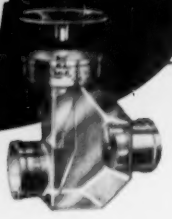

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PROFESSIONAL NEWS IN CAPSULE FORM

A Roundup of Late Events for Professional Engineers

Vance Joins AEC

Harold S. Vance, former chairman of the executive committee of the Studebaker-Packard Corporation, South Bend, Indiana, has been sworn in as a member of the Atomic Energy Commission by Chairman Lewis L. Strauss. Mr. Vance's interim appointment to the term ending June 30, 1960, was announced recently by President Eisenhower.

Mr. Vance, a native of Port Huron, Michigan, had been with the Studebaker Company from 1911 to 1917 and from 1919 to the time of his appointment. From 1918 to 1919, he was a production engineer with the Bethlehem Steel Company. He has also been a special consultant to the Director of the Office of Defense Mobilization since 1953.

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Reitell Is Director Of Zurn Foundation

The Zurn Foundation, Erie, Pennsylvania, which was organized several years ago for business-industrial research, aid to education, and charitable purposes, has announced the appointment of Dr. Charles Reitell, noted educator and business author, as executive director.

The Zurn Foundation, which also has offices in New York, was established by gifts and grants from the Zurn family and its various business enterprises.

Dr. Reitell of Elmira, New York, holds degrees from the Wharton School of Finance and Commerce, University of Pennsylvania, and the University of Wisconsin. For many years he was a partner in the New York firm of Stevenson, Jordan & Harrison.

❁

School Effectiveness To Be Studied

Representatives of the seven construction departments of units of the State University of New York met at the New York City Community College of Applied Arts and Sciences recently to plan a questionnaire to the construction industry on the effectiveness of graduates and courses. This will be the first such study the University has made in the construction field. Engineering and related courses will be included.

"My goodness—he must've been quite fond of that idea of his!"

❁

Marine Engineer Receives Sperry Medal

William Francis Gibbs, New York naval architect and marine engineer, was recently selected as the first recipient of the new Elmer A. Sperry Award for distinguished engineering contributions to the world's art of transportation. The award, consisting of a bronze medal, a certificate, a copy of the biography of Elmer A. Sperry, and an honorarium, was given to Mr. Gibbs in recognition of his many and continuing contributions to progress in sea transportation. It was presented during the Diamond Jubilee Meeting of the American Society of Mechanical Engineers in Chicago last month.

❁

Rotary International Officers Include Engineers

Four engineering specialists, it has been announced, are now serving as officers of Rotary International, the world-wide service club organization. One—H. J. Brunnier, a consulting structural engineer of San Francisco—is a member of the California SPE and NSPE. Mr. Brunnier's Rotary office is that of trustee of The Rotary Foundation, and he is also a member of the Rotary International Headquarters Committee.

He is a specialist in the field of earthquake and difficult foundation problems and has been responsible for the structural safety of many large buildings and bridges on the Pacific Coast and in other parts of the world. He has received many honors, including being named "The

West's Outstanding Engineer" by the Building Industry Conference Board and being elected an honorary member of the Institute of Engineers of Chile.

In addition to Mr. Brunnier, the other Rotary officers who are also engineers, are: Walter F. Heise, works engineer, Bethlehem Steel Co., Pottstown, Pennsylvania; H. Conger Jones, civil engineer and surveyor of Del Rio, Texas; and I. W. Parrish, Jr., drainage engineer, St. Anne, Illinois. Each of them is a district governor of the service group.

❁

Professor Allen Elected To Md. U. Executive Group

Professor Russell B. Allen of the College of Engineering of the University of Maryland is one of seven members of the faculty senate recently elected to the senate's executive committee. Professor Allen is also treasurer of the National Society of Professional Engineers.

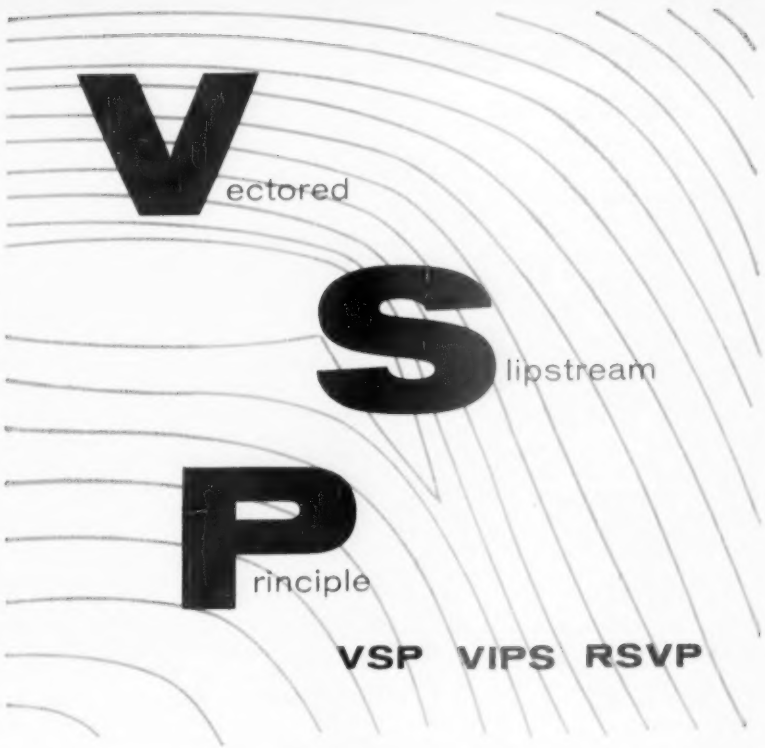
At Maryland, all full-time faculty members with the rank of instructor or above are members of the University's newly-established faculty assembly. They, in turn, elect the senate, which has one member for each eleven faculty members, with at least two senators from each college or school of the university. The executive committee, to which Professor Allen has been elected, is made up of seven members plus the University's president, Dr. Wilson H. Elkins.

❁

Rohlich, Katz, Receive Awards

Two members of the Wisconsin Society of Professional Engineers and NSPE were among four Wisconsin men who recently received national awards for outstanding service from the Federation of Sewage and Industrial Wastes Associations. They are Professor Gerard A. Rohlich of the University of Wisconsin's Civil Engineering Department and William J. Katz, sanitary engineer in the Research Department of the Chain Belt Company, Milwaukee. They, together with William L. Lea of Madison, director of the Division of Industrial Hygiene, Wisconsin State Board of Health, received the 1955 Harrison Prescott Eddy Medal for outstanding research in the field of sewage waste treatment.

The Federation's Charles Alvin



Advanced research at Fairchild in the applications and effects of the Vectored Slipstream Principle has brought about the need for qualified aerodynamicists who have worked in this vital field, and who can make valuable contributions to its development.

Fairchild, producers of the famous C-119 *Flying Boxcar* and C-123 *Provider*, are now preparing transports, advance reconnaisance aircraft, fighters and missiles. Experienced aerodynamicists with VSP background will find these challenging new programs an exciting, stimulating climate in which to utilize and profit from their experience.

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He must have the ability and patience to train and supervise local engineers and draftsmen. To this end a working knowledge of Spanish would be of great help, but is not essential.

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Emerson Medal for 1955 was awarded at the same time to Dr. M. Starr Nichols, assistant director, Wisconsin State Laboratory of Hygiene, and professor of sanitary chemistry, University of Wisconsin.

❁

Standards Honors Are Bestowed in Washington

Two of the country's highest awards in the standards field were bestowed recently during the American Standards Association's sixth national conference, held October 24-26 at the Sheraton-Park Hotel in Washington, D.C. The Howard Coonley Medal was given to Harold S. Osborne, formerly chief engineer, American Telephone and Telegraph Company, and past president, International Electrotechnical Commission; the Standards Medal was awarded to James G. Morrow of The Steel Company of Canada, Ltd., a past chairman of the Canadian Standards Association, and past president, American Society for Testing Materials.

❁

Carleton Is Chairman of Columbia U. Council

Robert A. W. Carleton, a New York construction engineer and a member of NSPE, has been elected chairman of the newly formed Engineering Council of Columbia University. Evan B. Lloyd, director of development for the new Columbia Engineering Center, has been elected secretary of the group. The council advises the trustees, faculty, and dean of engineering in the development of the School of Engineering Center.

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Basic Research Institute At California University

An Institute for Basic Research in Science is being established at the University of California in San Francisco, according to an announcement by Chancellor Clark Kerr. It is being set up with an initial fund of $2,750,000, gift of a single donor who wishes to remain anonymous, according to the announcement, and will have an annual budget of $100,000 at the outset, which amount will ultimately be doubled.

The donor has provided that the new institute dedicate its activities "to the encouragement of creative thought and the conduct of research and investigation in pure science" and has specified that one of its primary purposes shall be "to discover and encourage the work of individuals of great talent and promise."

❁

Saville Heads ECPD

Dr. Thorndike Saville, dean of the New York University College of Engineering, has recently been elected president of the Engineers' Council for Professional Development, the organization whose major function is the accreditation of programs in engineering colleges. Dean Saville is also president of the Engineers Joint Council, as well as a member of NSPE.

❁

MacMullin Honored by AIChE

R. B. MacMullin, a well-known consulting engineer of Niagara Falls, New York, and a member of NSPE, has been honored recently by the New York Section of the American Institute of Chemical Engineers. He was presented with the group's Annual Professional Achievement Award during a dinner meeting at which he also was the featured speaker.

Mr. MacMullin is the senior partner in the firm, R. B. MacMullin Associates, consultants to the chemical industries.

Plan now to participate in National Engineers' Week! No time like the present to find out about your local program!

Industrial Research Award

Maurice Holland, New York industrial research advisor, has been presented with a special Founder's Award by the Industrial Research Institute. When the presentation was made at a banquet held at the Shamrock Hotel in Houston, Texas, during the Institute's fall meeting, Mr. Holland was cited for "his vision, persistence, energy and skill in laying the foundation on which the Industrial Research Institute has been built, thereby advancing the cause of industrial research and contributing materially to the welfare of the Nation."

❁

Walter J. Barrett Elected By Engineering Trustees

The United Engineering Trustees, Inc., have elected Walter J. Barrett as president for the coming year. Well-known in engineering circles, Mr. Barrett is treasurer and a director of the American Institute of Electrical Engineers, which he represents on the UET board. He is an electrical coordination engineer of the New Jersey Bell Telephone Company, Newark.

United Engineering Trustees owns and operates the Engineering Societies Building on West 39th Street in New York City; the building was a gift from Andrew Carnegie as "a union home for engineers." It also owns and operates the Engineering Societies Library and the Engineering Foundation, the latter having been established for organized "research in science and engineering and the advancement in any other manner of the profession of engineering, and the good of mankind."

❁

Van Leer Urges More Technical Institutes

"I believe that the technical institute is the most important idea in education to be considered in the last twenty years, stated Georgia Tech President Dr. Blake R. Van Leer, speaking in East Lansing, Michigan, on November 14, before the Engineering Extension Section of the Engineering Division, Association of Land Grant Colleges and Universities, at its annual meeting at Michigan State College.

"The technical institute concept is still growing," he said. "It is flexible, and therein lies another of its advantages."

The Georgia Tech educator, who is also a member of NSPE, pointed out that "industry needs technicians to continue its growth. In 1941, it was estimated that 25,000 to 30,000 technicians could be absorbed annually by industry. Today, with our great industrial expansion, the technological developments of the last decade, and the decentralization of industry, the technicians needed probably approach 100,000 annually. . . . Recent surveys show that at least five technicians are needed for each engineer."

According to Dr. Van Leer, Georgia Tech pioneered the modern technical institute program in the South through the establishment in 1948 at Chamblee, Georgia, of the Southern Technical Institute.

"We who have taken part in the development of the technical institute program make no apologies for introducing a new pattern in education," he concluded. "We visualize the need for many more technical institutes to fill the gap in education, and we are proud of the records made by existing technical institutes."

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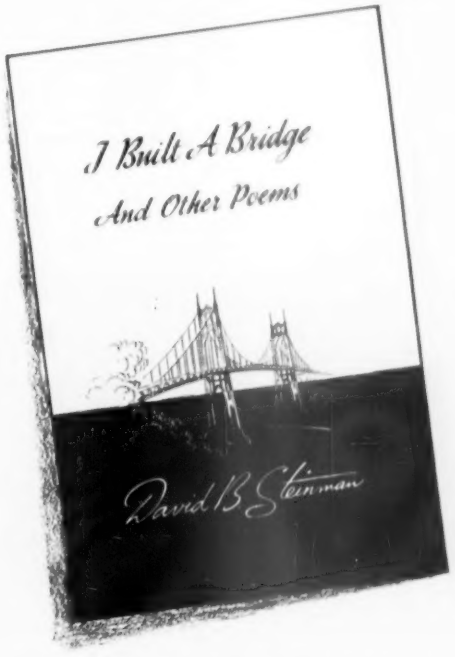

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_____

AT THIS CHRISTMAS SEASON, the age-old dream of lasting peace on earth occupies the minds of all thinking people. To our Nation's leaders who carry the world's problems every day of the year, the search for peace knows no season. This year two of the men who have taken new and bold steps to ease the tension in which the world lives have been President Eisenhower and his Special Assistant dealing with disarmament matters, The Honorable Harold E. Stassen. One new approach offered was the proposal for the exchange of aerial inspections between Russia and the United States.

Because of the engineering implications inherent in this unique "step to peace," the AMERICAN ENGINEER feels it worthy of more than passing interest. Therefore, on the following pages are presented the views of an expert on what could be a very significant beginning in the realization of man's hope.

Despite the recent discouraging days at Geneva, Russia has not finally turned down the aerial inspection idea but refuses it as a "first step." Possibly the future may still find planes of both nations becoming, as Governor Stassen has termed them, "sentinels of peace." Other pertinent statements of the Governor are recorded below.

"The President's proposal at Geneva to the rulers of the Soviet Union for an exchange of a blueprint of our armed forces and for opening up both countries to comprehensive reciprocal inspection with the aid of aerial photography, went to the very heart of the crucial alternative before the world. It set forth in clear and practical terms a beginning for the establishment through agreement of a peace founded on sound international law.

Governor Stassen

"The President's Geneva proposal opened the gateway to a far-reaching, firm and attainable reduction in the danger of war.

It calls for freedom in the skies above the United States and the Soviet Union for the purposes of aerial inspection by the other country.

The peaceful unarmed planes, carrying representatives of both the inspecting and inspected countries would be permitted to fly where they please, report what they see, and take any, and as many aerial photographs as they may deem necessary.

The result would be this: Distrust would diminish, the awful threat of surprise massive attack would be reduced, suspicions of aggressive intent would shrink.

"We must never forget the closing words of the Geneva Disarmament message, in which the President cautioned "A sound peace . . . with security, justice, well-being and freedom for the people of the world . . . can be achieved, but only by patiently and thoughtfully following a hard and sure and tested road."

. . . I have faith it will be done because, if mankind is not to slip back to a dark age, it must be done. As the President has so forcefully and frequently reminded us, "There is no longer any alternative to peace."

American Engineer

The Magazine of the Registered Professional Engineer

VOLUME TWENTY-FIVE NUMBER TWELVE

Aerial Inspection—An Engineering Step to Peace

By

DONALD J. BELCHER, P.E.

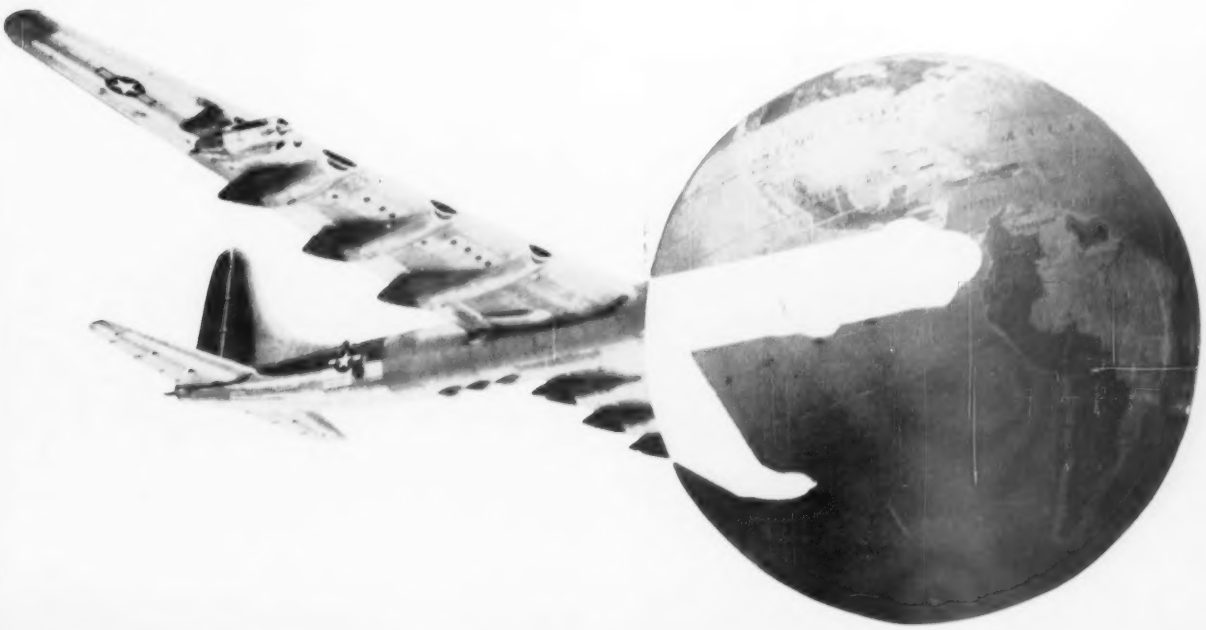
President, Donald J. Belcher & Associates, Incorporated

ONE of the most electrifying and dynamic proposals of the modern era was made by President Dwight D. Eisenhower at Geneva when he offered his aerial inspection plan to the Soviet leaders during the recent meeting at the "Summit."

While the suggestion immediately caught the imagination of the entire world, it should have been even more exciting to members of the engineering profession because it will be only through the application of engineering skill that the proposal can be made effective.

The prospect of being able to inspect at will the vast reaches of the Union of Soviet Socialist Republics—and of having the United States similarly surveyed from the air—is a most startling one. The aerial inspection method is one which is far more powerful and telling than is even yet realized by those outside the scientific fields involved. Some persons, both here and abroad, who applauded the proposal at first, now seem somewhat puzzled as to exactly how such a revolutionary plan would be put into effective operation. Mr. Molotov has stated that it would be too expensive, in rejecting it as a first step toward disarmament during the just-adjourned Foreign Ministers' Conference, also held at Geneva. Yet the actual fact is that the method is a relatively economical one; and certainly its over-all, long-term cost would be minute compared to the incalculable cost of a third world war.

Peace may well be preserved if we are informed with accurate facts regarding the conduct of other nations. So purely from a logical approach and a knowledge of the potential in aerial photography, it is possible for us to visualize the execution of the Eisenhower plan and



An example of a fabricating plant producing bridge sections in which the stockpiles of rolled stock members are shown in the lower left of the picture. At the opposite end of the factory, the bridge sections and fabricated high tension power line structures can be seen. In this instance, a structural engineer could make measurements of the two spans of fabricated bridge section and estimate the capacity.

thus to accord it the high degree of confidence and support which it deserves.

For a nation to undertake a war today requires extraordinary industrial capacity for the manufacture of the essential materials of modern technological warfare, plus a capacity to transport troops, equipment, and other war material. It also requires military capacity in the form of manpower and equipment mobilized in tactical situations. Or for a purely air war, airfield activity must be increased tremendously.

It is logical then, that aerial inspections would provide clues to abnormal activity in any and all of these fields and would expedite evaluation of such activity for coordination with other inspection methods.

Much of this is an engineering job—a specialized mapping operation requiring the services of engineers from many fields: highways, railroads, utilities, industrial, sanitary hydraulics, structural, chemical and others.

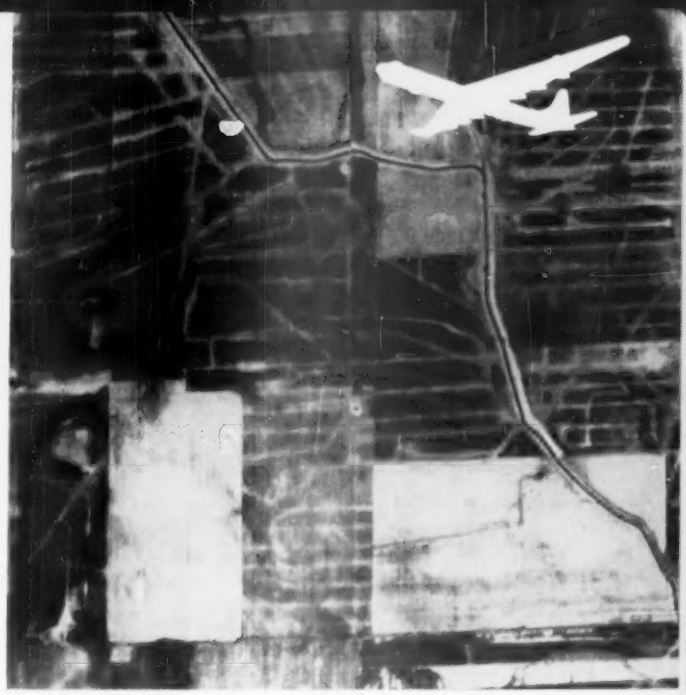
SINCE we know little of the modern geography of the Russian areas, which we would inspect under the plan, we will first need an up-to-date base map, a composite photomap or a photo-mosaic—small scale pictures of the country, taken economically from high-flying aircraft and showing the major detail of cities, ports, industrial centers, the road system, and airfields.

The first basis to establish is the degree of detail recorded in a photograph. When aerial photos are used properly, they are used in pairs—stereoscopic pairs. Instead of a flat picture, this use in pairs gives the observer the complete reality of a truly 3-D view. This is immensely important and when the view is magnified, it gives us a precise terrain model and all the features on it.

With this model, what can you see then that is of value? What can be recognized? A road, for example, can be recognized as such by a layman even on one picture. Our engineers, using stereo-vision, see the tar-filled cracks in a concrete pavement, even though the plane that took the photo was two miles above the earth. To the casual observer, all roads may look alike, but an engineer interpreter can distinguish between dirt, gravel, and other higher type roads even in high altitude photographs. As a result, an entire road system can be carefully classified and evaluated.

It is often suggested that buried features would escape notice. Certainly we are not conscious of the several hundred buried pipelines of various kinds that we cross in a day's travel. But from the air, when recorded in a photograph, gas, oil and other buried transmission lines are as clearly seen as though they were laid on the surface. Small clay tile lines installed to drain a field may be seen in spite of the fact that the farmer has plowed and planted crops over them for many years. In our laboratories even buried villages of ancient Egypt, old fortifications in Iran, and long-crumbled city walls of medieval Britain have been discovered through the searching analysis of aerial

This is a partial view of an industrial plant showing, in the upper center, the high tension transformer cages that permit an electrical engineer to accurately estimate the power requirements of the plant. In the center and left center, the narrow lines that converge to the left are railway sidings and storage yard. In a stereoscopic examination of this photograph, it is feasible to count the flat cars and to measure the approximate length of the steel sections loaded on the cars to arrive at the tonnage of steel prepared for shipment. From the arrangement of the chimneys and the large circular storage tank, an industrial engineer acquainted with steel production can then analyze the flow pattern of the ingots entering the long building at the top as they progress through the various mills to arrive as finished shapes. Even the intricate pattern of black paths interlaced through the white yard area in the lower center tie the various buildings together to give the complete linkage of the various manufacturing operations.



Here is another illustration of the detail to be seen *in* the ground by an experienced analyst. The pattern of white lines is a system of 4-inch clay tile drain pipe *buried 4 feet below the surface.* The photograph was take at 10,000 feet.

photographs. These and the hundreds of other minute features that can be determined and studied are simply an indication of the competent analyst's ability to examine an area by aerial inspection and give meaningful interpretation to what his trained eye sees.

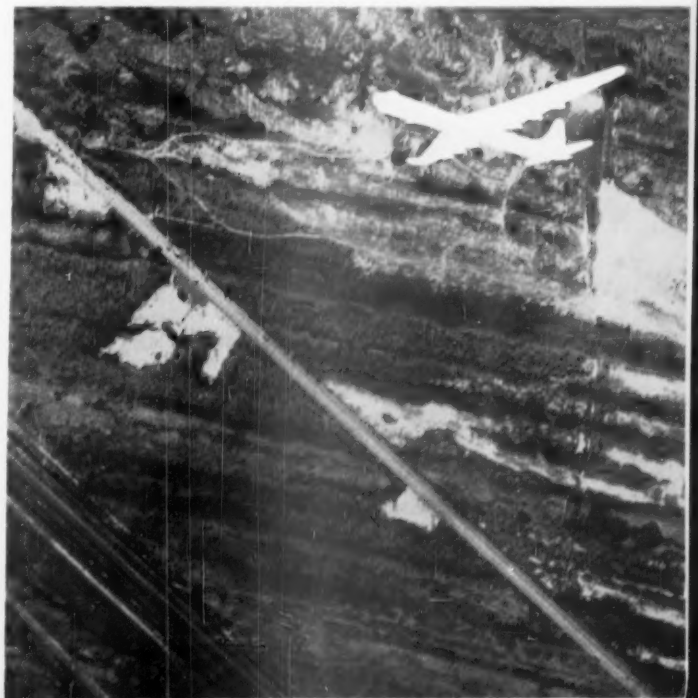
The general photomap would thus serve as the basis for the actual inspection photography. The completed map would enable us to locate and identify the major lines of transportation, industrial areas, airports, and military training centers.

All activity of any significant size and duration leaves its "fingerprint" on the surface of the earth. By studying these photomaps, we would be able to perform the important task of eliminating all but 2 to 10 per cent of the total area, in which actual war buildups might occur. If all of the Communist territories including the satellite nations would be included, then we could eliminate about 99.5 per cent of the entire area, and concentrate on approximately ½ of 1 per cent. Even this small percentage would be a large area in terms of square miles, but it can be further reduced by a photo sampling program controlled on a statistical basis, both as to area covered and the frequency of the sampling. These are fundamental problems of mathematics and engineering that are solved daily in other fields.

The continuing study of the small percentage of the total area would be concentrated first on lines of communication and transport because they are the arteries of the system that would supply war goods. Tonnage movement on both road and rail can be known by these methods. Under a continuing surveillance program, new rail connections and new roads would be detected and follow-up photography would determine their purpose.

THEN we can consider the factories. Since they require transportation facilities, for supplies and shipment of finished goods, they will be associated with the transportation system. Factories, power plants, and other similar facilities have identifying features related to their function. It is absurd to claim that great forests or skillful camouflage will hide them, even if the factories go underground. A good photo-analyst can "see through" artificial camouflage, while natural camouflage fades or changes so rapidly with the laws of Nature that it becomes relatively ineffective and then useless in a very limited time. Confusion on this point may have developed because clever camouflage of one sort or another *can* hide an installation from the aerial observer who is flying overhead at a particular moment but the photographs that he takes are another story. When they are studied properly the revelation of hidden factories, power plants, or other constructions is inevitable.

Warehouses, storage yards, stockpiles, shipping facilities, labor supply, and power facilities were all observed to some degree during the last war, in spite of anti-aircraft fire. A chemical engineer accurately fixed the products and capacity of a German chemical plant when the data was extracted from color sensitive film and measurements were made of stockpile quantities and storage tank capacities. It is possible, although it may not yet be practical or necessary under this inspection system, to execute a version of the traffic engineer's origin—destination studies. In so doing, we could learn the destination of freight cars originating at some central factory and then also learn much of its output



A four-lane highway carrying mixed passenger and industrial traffic is shown. It can be noted that expansion joints can be seen in this picture, as well as the character of the traffic on the road. With the unaided eye, two semi-trailer trucks, one gas tank truck, one stake body truck, and a scattering of passenger cars can be identified. Using this type of photography, taken periodically at critical points, it is possible to evaluate the movement of industrial or military traffic.

These relics of a bygone era, an old water line of hollowed-out wooden logs in Augusta, Ga., would not escape detection from aerial photography although buried far beneath the ground. Also see photo on page 13.

and the purposes for which its production is being used.

Military establishments and training areas also have their own characteristics that lead to a direct identification of the area of service and its capability. For example, when airline passengers approach the city of Louisville, they are impressed by the "white scratches" in the ground that are really tank tracks made during exercises of the armored vehicles previously stationed at Fort Knox.

Aerial photography of such an area, performed at will, would certainly give a good military interpreter an appraisal of combat units that might be stationed there. The observation of activities in these areas would provide an immediate and direct indication of a country's purposes. The railroads and highway facilities used would provide the key to direction of movement.

One can imagine the results of such aerial reconnaissance conducted along the right of way of the Trans-Siberian railroad in the months preceding the Korean affair, when tonnage must have increased many, many times. Since armored vehicles and artillery are shipped in open flat cars, it would have taken little more than direct counting to evaluate the buildup.

AIRFIELDS have likewise been a surveillance target in every action where air power counted, so that we could rely on the experience developed by our Air Force to provide the clues to aeronautical evaluations of the photographed facilities.

There can, of course, be a few drawbacks to the plan. We cannot expect aerial inspection to detect an atomic plant incorporated into a large factory producing standard products. There the influx of materials and the shipment of finished products would obscure the presence of the war plant. In this country, before the first bomb was dropped, the chemicals and special processes leading to the final A-bomb were probably processed in a number of widely scattered plants, in such a manner that even those working with the components did not know of their significance. This, of course, can be repeated and detection made virtually impossible. It is easy to see that even the radioactive wastes could be shipped to a distant point for disposal.

However, a war is not waged until the bombs are delivered, and unless they are hand delivered in suitcases, there will be some major activity even if it is only defensive precautions against retaliatory measures. Because of these possibilities, a maximum effective inspection plan would necessarily be an integrated one that would rely on several sources of information and not wholly on one method. The aerial photographic phase, however, is the most unique and the most broadly effective of all. If adopted, it will indeed be a challenge to our engineering and scientific genius. And its fulfillment will be a worthy application of the highest professional ideal of service to mankind—engineering skill used for the preservation of the peace of the world.—***End.***

Serving the Fairless Works of the United States Steel Corporation and other new industry moving into the rapidly growing industrial area in the Delaware Valley, the Morrisville Yard of the Pennsylvania Railroad has been expanded and improved at a cost of over $9,000,000. Such installations as these would be carefully watched by other countries under President Eisenhower's plan.

Photo by Pennsylvania Railroad

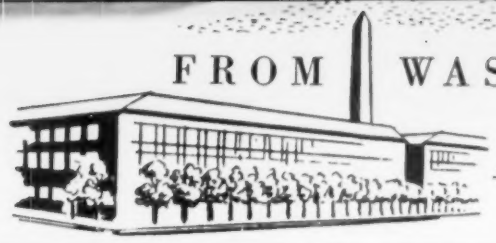
About the Author . . .

Donald J. Belcher

Donald J. Belcher is president of Donald J. Belcher & Associates, Inc. of Ithaca, N. Y., a firm which specializes in the application of airphoto analysis and interpretation to engineering, as well as the development of natural resources, agriculture, and planning.

Mr. Belcher pioneered in the original applications of photo-analysis while at Purdue University, from which school he also holds B.S., M.S., and C.E. degrees. In 1946, he went to Cornell University as a professor of civil engineering. He founded, and is director of the Cornell Center for Aerial Photographic Studies. Until resigning the position last year, he also was head of the Department of Transportation Engineering at Cornell.

His firm has worked on many of the largest hydroelectric projects in Canada and other countries, making materials surveys and engineering geology investigations. In addition, the organization has recently completed the largest photo-interpretation project in history in selecting a site for the new capital city of Brazil.



FROM WASHINGTON

By
Milton F. Lunch,
N.S.P.E.'s Legislative Analyst

SALARY HEARING: WAGE-HOUR REGULATIONS

ON December 12, 1955, Newell Brown, Administrator of the Department of Labor's Wage & Hour Division, will start public hearings to determine whether changes should be made in the level of salaries required for exemption of professional, executive and administrative employees from the minimum wage and overtime pay provisions of the Federal Wage-Hour Law.

The Wage-Hour Law establishes the exemption of the professional, executive and administrative employees, but does not define the qualifications for inclusion in one or more of the exempt categories. This function is left to the Administrator. From the beginning, the Administrator's definition of "professional employee" has been in terms of the performance of duties requiring advanced knowledge, customarily acquired by specialized intellectual instruction, original and creative in character, requiring the consistent exercise of discretion and judgment in its performance, etc. The similarity between this definition and that used for "professional employee" in the Taft-Hartley Act is apparent, because the latter definition was based largely on the Wage-Hour Administrator's definition.

However, one of the major differences between the two definitions is that the Wage-Hour Administrator has consistently required, in addition to the general qualifications, a minimum earning level. This was first established at $200 per month and in January, 1950, was changed to $75 per week, where it now stands. The purpose of the forthcoming hearing is to determine whether a new (and higher) figure should be substituted. A distinction should be noted between the administrative hearing and the proposals pending in Congress to change the law itself to require a minimum salary of $6,000 per year for professional status (AE, March, 1955).

NSPE testified at the hearing preceding the 1950 administrative changes, presenting the economic facts then available on earnings of professional engineers, and urged a major revision in the regulations which is of particular importance to registered engineers (AE, Dec., 1947). This recommendation involved the portion of the regulation which states that the minimum salary test "shall not apply in the case of an employee who is the holder of a valid

Mr. Newell Brown
Administrator
Wage & Hour Division
Department of Labor

license or certificate permitting the practice of law or medicine or any of their branches and who is actually engaged in the practice thereof." In other words, a registered doctor or lawyer is recognized as "professional" without any reference to salary, but not engineers, architects and other professionals.

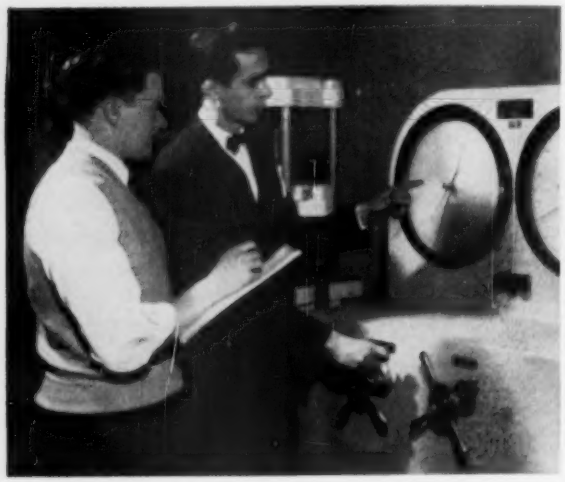
At the earlier hearing, NSPE stated: "The very definition of a 'professional engineer' in the various State laws indicates the full professional status of the engineer . . . the registered professional engineer is a full member of the professional world and as such is entitled to be placed on an equal footing with the other learned professions. . . . . The hearing officer in 1940 further recognized that . . . the action of the appropriate State authority in issuing the certificate or license may be taken as an adequate substitute for the salary test in the case of the professions

(Please turn the page)

of law and medicine. We submit that the engineering profession has reached the point which entitles it on this same basis to recognition as a profession. . . . This change will give the Registered Professional Engineer his rightful due. It will recognize that the action of the appropriate State authority in certifying the professional status of an engineer is a full and adequate test to determine that such a person is a 'professional' within the meaning and intent of the Fair Labor Standards (Wage-Hour) Act."

The hearing officer rejected the NSPE recommendation, stating:

"The practice of law and medicine has a long history of state licensing and certification; the licensing of engineers and architects is relatively recent. While it is impossible for a doctor or lawyer legally to practice his profession without a certificate or license, many architects and engineers perform work in these fields without possessing licenses, although failure to hold a license may limit their permissible activities to those of lesser responsibilities. ***



NSPE will continue to press its view that registration of professional engineers under state law is a sufficient basis for determining professional status and that the regulations of Wage-Hour should so recognize state licensure.

"The stated objectives of the architects (and) engineers . . . in seeking exceptions from the salary requirement . . . were to achieve recognition for these fields of endeavor as professional and the desire to place them on a par with medicine and law as professions. These are worthy objectives with which I sympathize but they are, of course, unrelated to the purposes of . . . the Act. In any event, I do not see how deleting the salary requirement would advance the recognition of these activities as professions or for that matter, that any such action is necessary to prove that these are bona fide professions.**"

The rejection, the hearing officer stated, "is without prejudice, however, to reopening the question with respect to architecture, engineering, or any other profession, at any time such profession achieves universal state licensing or certification of all its practicing members on the basis of standards comparable to those in effect for the licensing of physicians and lawyers."

At the forthcoming hearing it is expected that NSPE will again press its view that registration under state law is a sufficient basis for determining professional status and that the regulations of the Wage-Hour Administrator should so recognize state licensure which, since the earlier hearing, has spread to every jurisdiction. Also, the vast increase in the number of registered engineers, now reported at 197,000, in addition to thousands of certified engineers-in-training, will be stressed at the hearing. At the recent Memphis meeting of the NSPE Board of Directors, a policy statement was adopted which declares that "a recognition of the essential differences between professional and non-professional employment is sound," and further declares that the Society is opposed to minimum earning tests to qualify for professional status.

This policy statement is predicated on the recognition of the need for flexibility in the working relationship between professional engineers and employers and is further based on the advantages of improved professional status, in the following terms:

"The National Society of Professional Engineers believes that cooperative efforts should be continued and expanded to bring about a greater recognition of professional status of professional engineers, both in terms of remuneration and in employment conditions. Employers should be encouraged to accord their professional engineer employees professional status in the fullest sense; in terms of improved economic position, allowance of working time for outside professional activities, registration under the state engineering registration laws, advanced education, and in all other possible ways to encourage the true spirit of professional-employer relationships."

The forthcoming hearing may be considered as another opportunity for the professional society to continue its program of recognition of the professional status of engineers under state registration and the development of professional conditions of engineering employment.

An Article Not To Miss...

THE article on the following pages by Mr. Cooper is worthy of the attention of professional engineers, industrial management, society officers, and all others interested in the welfare of the engineering profession and American industry.

Mr. Cooper gives us a convincing example of what can be achieved through a cooperative program brought about by industrially-employed engineers who feel their professional responsibility and an enlightened management. Many other companies have programs of a comparable nature and their achievements should likewise be recorded as an example and a guide.

Although the program described in this article may not be applicable or practical in all respects to other large employers of professional engineers, the cooperative professional spirit behind this particular program is of a type which is visualized in the publication, "A Professional Look At The Engineer In Industry." It will be recalled that that publication of the NSPE Engineer-in-Industry Committee concluded with a chapter on "Facing Up To The Challenge," in which the statement was made:

Mr. Blackburn

> ". . . we have attempted to show many concrete examples of efforts that industrial management, engineers and the professional society can make to assist both industry and engineers to work together in an atmosphere of harmony.
>
> "Our studies have led us to the conclusion that there is no need for dividing engineers and managements into separate 'armed camps.' Instead, the over-all problem can be most satisfactorily solved by cooperative efforts between enlightened management and forward thinking engineers."

SOME have said that management will not cooperate to achieve the desired results. Mr. Cooper's article refutes this defeatist and negative attitude. Management will cooperate in most cases where an earnest effort is made because it is to the best interests of the company that it do so. The proof of this statement is in Mr. Cooper's recitation of the convincing fact that among more than one hundred engineers, only one has left the company in the three years since the cooperative professional program has been in effect. Compare this with the inefficient and expensive record in other companies where engineering turnover has become a major problem!

We commend this article to your attention and hope you will give it the careful reading it deserves. And we hope that it will inspire other professional engineers and other industrial leaders to develop programs of a similar nature, geared to the unique circumstances applicable in each individual case. Such programs are in keeping with the NSPE spirit and with the theme of our Annual Meeting Conference in June, 1955—"Professional Development—The Responsibility of Industry and the Engineer."

Robert A Blackburn

Chairman, Employment Practices Committee, NSPE

Read About the Dow Program on the Next Few Pages . . .

From Time to Time the American Engineer Will Present Case Histories of Professionalism in Industry in Action. Read the Article Below and Then Watch for Future Stories.

Professionalism in Industry: The Dow Story

By

H. P. COOPER, P.E.,

Design Engineer,
The Dow Chemical Company,
Texas Division

J. M. Parish (right), chief engineer of Dow's Texas Division, is congratulating Raymond C. Witt (left) who has just received his registration papers from the Texas State Board of Registration for Professional Engineers.

AN ATMOSPHERE of professionalism is an outstanding feature offered to the registered engineer in the Engineering Department of The Dow Chemical Company's Texas Division at Freeport, Texas. Policies formulated under the leadership of Chief Engineer J. M. Parish emphasize professionalism for the more than one hundred engineers in this organization. Some of these policies are set forth in an Engineering Department Personnel Manual. Briefly stated, they are:

1. **Professional registration is encouraged.**
2. **Registration is a requirement for advancement to classifications above Design Engineer.**
3. **Each engineer must place his professional seal on his work.**
4. **Semiannual personnel reviews are conducted to increase supervisory knowledge of each engineer's professional progress.**
5. **Membership in technical and professional societies is encouraged.**
6. **Duties and responsibilities are occasionally changed.**
7. **The engineer is kept informed of department and company activities and is given an opportunity to become familiar with the production plants.**
8. **Young engineers are trained for advancement in the department.**
9. **Job stability is assured.**

These items are discussed in greater detail in the following paragraphs.

Professional recognition and legal authority to practice engineering in Texas are obtained through being licensed by the State Board of Registration for Professional Engineers. All engineers are encouraged to become licensed as soon as they are qualified. An administrative assistant to the chief engineer maintains and makes available to all personnel files on registration requirements, registration application forms, and instructions to applicants. Duplicate certificates of all professional engineers in the department are framed and mounted in the main foyer of the Engineering Building.

A professional engineer's license is very desirable for all who attain the classification of design engineer, even though it is a specific requirement for only those engineers who are not graduates of accredited schools. Frequently a graduate of an accredited school is qualified and attains this classification prior to the time he has acquired the four years' experience necessary for registration in Texas. Any design engineer who wishes to advance to senior design engineer, group leader, or any classification above design engineer, must meet the qualification of registration before he will be considered for advancement. There are no exceptions to the policy.

THE procedure for use of the professional engineer's seal is given by the following quotations from the Engineering Department Personnel Manual: "Engineering is creative work. It is only right and proper that the engineer should receive due credit and be able to maintain reasonable control of his work as he is responsible for its soundness, safety, and efficiency. . . . As the Engineering Department believes that it is to the best interest of the company, the department, the individual, and the profession to give due recognition to these facts, this department will issue as an approved drawing no tracing reflecting the results of engineering design unless it bears the professional seal of a responsible engineer. . . . After a tracing has been completed and checked, it shall be stamped with the seal of the

> The program suggested herein depends upon the willing cooperation of the professional society, industrial management and the engineer. We specifically reject the contention that industry will *not* do its part in seeking an improvement in the professional and economic standards of its engineers.
>
> —From a "*Professional Look at the Engineer in Industry*," published, 1955.

registered professional engineer under whose direction it was prepared."

This procedure functions so that each registered professional engineer seals the tracings he prepares and those prepared by draftsmen under his supervision.

This is different from the policy found in many engineering offices, where the chief engineer or owner seals everything, even when it is impossible for him to check to be sure everything is correct. A very distinct advantage to having each engineer seal his own work is that he develops a feeling of individual responsibility rather than an attitude expressed by "What difference does it make? The chief engineer is responsible for it." Any engineer who feels and accepts the responsibility for his work will be more interested in that work and will ultimately produce a better quality product.

Twice each year a comprehensive review is made of all professional engineers in the department. Each supervisor makes an evaluation report on each engineer supervised by him, and each engineer makes a self-evaluation report. These reports are of the same scope and include such items as whether or not the engineer's standing has been reviewed with him, the engineer's potentialities for success, the advisability of classification changes, and a review of the engineer's outstanding accomplishments in his work, in furthering his education, and in extraprofessional activities. After these reports are complete, the supervisor reviews with each engineer his evaluation report and makes recommendations as to how he can improve himself. A personnel file containing an individual folder for each engineer's reports is kept within the department for future reference.

THE semiannual review program is effectively accomplishing the following:

1. **Maintaining a record of each employee's advancements and accomplishments as seen from both the employee's and supervisor's viewpoints.**
2. **Rewarding performances based on the employee's total record, rather than what happened last week or last month.**
3. **Improving employee-supervisor relations through better employee evaluation.**

> Our studies have led us to the conclusion that there is no need for dividing engineers and managements into separate "armed camps." Instead, the over-all problem can be most satisfactorily solved by cooperative efforts between enlightened management and forward thinking engineers.
>
> —From a "*Professional Look at the Engineer in Industry*," published, 1955.

Membership in technical societies is encouraged by these statements from the manual. "It is believed that every member of the Engineering Department interested in advancing in his profession owes it to himself and to his employer to join the basic technical society applicable to his main field of work. . . . In addition to membership in their basic technical society, members

Professional engineers (left to right) K. E. Honeycutt, E. K. Clark, B. H. Legett, and G. V. Grandjean form a panel discussion in a monthly meeting of Dow's Texas Division Engineering Department. These men discussed the Engineer-in-Industry Conference sponsored by NSPE, in Philadelphia, June 2, 1955, which they attended.

of the department are encouraged to join their *professional societies* and any specialist technical societies in which they may be interested." The chief engineer recognizes that an individual who has obtained his professional engineer's license and has become a member of his basic technical society is worth more to the company. Accordingly, it is his policy to consider an increase in pay for the engineer when he achieves both of these.

Every engineer is given an opportunity to attend, at company expense, one state or national meeting of his technical or professional society each year. This benefits both the company and the individual through the increased technical and professional knowledge gained from such associations.

> The problem and the challenge . . . is equally directed at American industry and the individual professional engineers who are associated with industry. If a solution is to be achieved it must emanate jointly from the professional engineering society, industry and the professional engineers. A major part of the responsibility lies with the professional society through support of professional objectives and cooperative activity and by initiating specific programs toward this end.
>
> —*From a "Professional Look at the Engineer in Industry,"* published, 1955.

OCCASIONALLY, the duties and responsibilities of the engineer are changed. This enables him to broaden his experience, to increase his knowledge of department operations, and to gain an insight into the problems of others.

The engineer is kept informed of department and company activities and is given an opportunity to become familiar with the production plants by the following means:

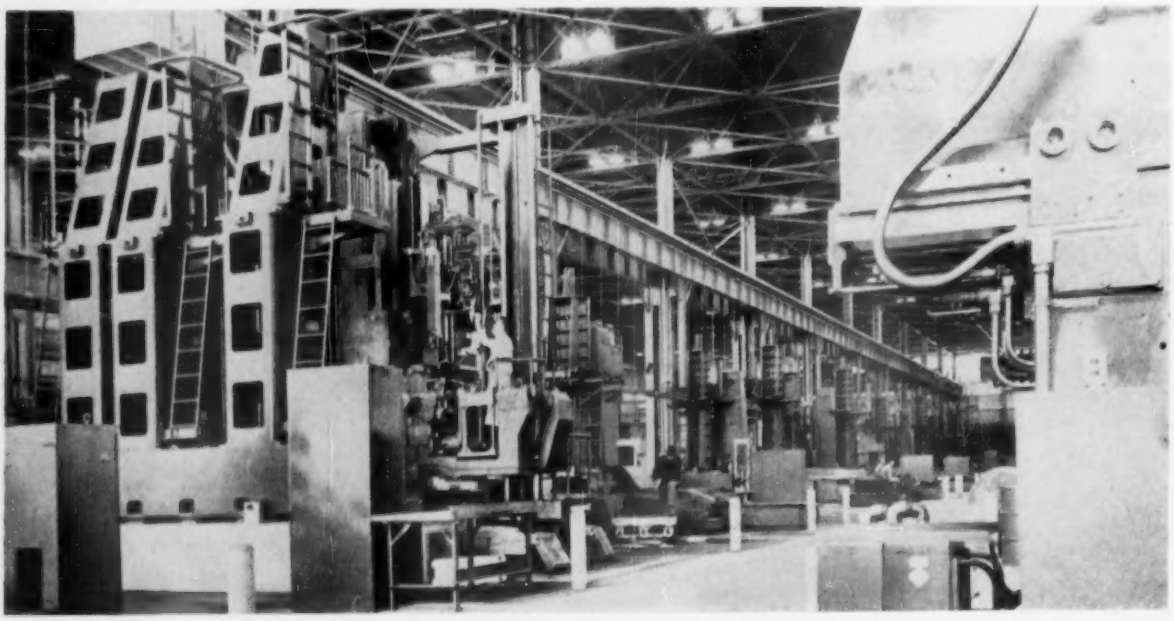
1. **Once each month at a general assembly of the department, the company-wide outlook regarding sales and production is discussed and the department's policies, work loads, types of work, and general plans are discussed.**
2. **Engineers are encouraged to visit the production plants on which they are doing maintenance or expansion engineering.**
3. **Engineers are encouraged to visit and see the actual construction of what they have designed.**
4. **Each member of the department and his wife are taken on a tour of the production plants.**

Opportunity for advancement is assured by this policy stated in the Manual:

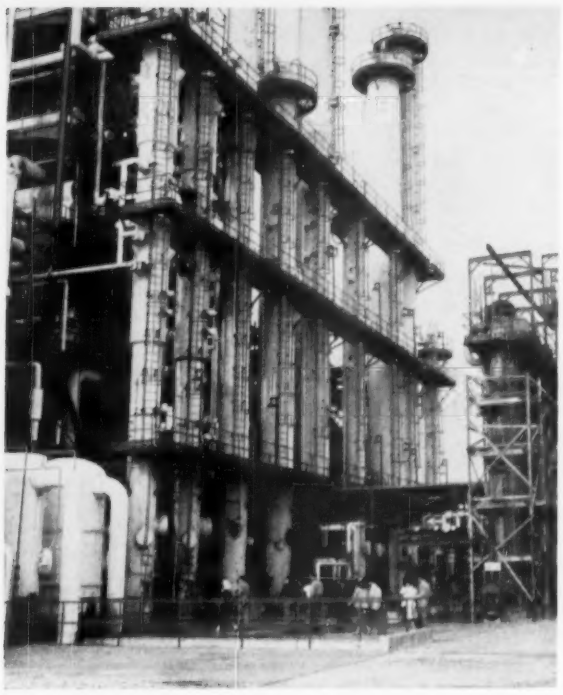
> "The intent of the organization over a period of time is to obtain and train men of ability to the end . . . that qualified successors are available for all positions."

Definite training programs have been instituted to give potential leaders the varied experience they need for advancement.

The total number of engineers employed in the department remains constant, regardless of varying work loads. During periods of minimum work loads, engineers work on special projects or are loaned to one of



In all segments of American industry—chemicals, metals (the Aluminum Company of America's Cleveland, O., works is shown above), manufacture—the engineer is today's man of the hour. Can he and his employer pull together for the benefit of both?



Several engineers and their wives during a tour of Dow's Texas Division production plants.

the operating departments. In an operating department the engineer has an opportunity to become familiar with the plant facilities and actual operating conditions. During periods of maximum work loads engineering manpower is augmented by bringing in engineers who work under Dow supervision, while actually employed by a consulting engineering firm. Entire projects or portions of projects are done by consulting engineering firms in some instances.

Another policy which adds to professionalism concerns the proper utilization of engineering manpower. Much thought and study is devoted to the elimination of non-engineering responsibilities for engineers. The effectiveness of this program has caused many changes in department procedure. A recent change in the processing of vendor prints is a good example of what is being done. Prior to the change, all work regarding vendor prints was handled by engineering personnel. Now the engineer's work with vendor prints is limited to checking the correctness of each print, while the clerical section takes care of indexing, classifying, filing, and routing these prints.

Two more practices, which are company-wide, should be mentioned. These are stock-purchase plans and opportunities for additional schooling and training. In recent years, the company has set up a stock-purchase plan whereby each employee may purchase an amount of stock in the company proportionate to his salary. This has enabled many engineers to become part owners of the company.

An outstanding example of additional schooling available to the engineer is the current series of graduate courses being taught in this area. Arrangements for these courses have been made by Dow. They are conducted by professors who come to the area from accredited colleges. Graduate credit is given for these courses.

The policies stated here create a genuine sense of professionalism. In this office they are responsible for a remarkably high ratio (70 per cent) of registered professional engineers. A majority of the remaining 30 per cent are planning to be registered as soon as they have gained sufficient experience. This is a record of which any organization of one hundred engineers, whether industrial or consulting, might well be proud. Positive proof of the effectiveness of this program is that since its incorporation more than three years ago only one engineer (as of September, 1955) has left the department for work with another company, and only a few have transferred to jobs in the production departments of this plant.

> . . . Forty-two per cent of the companies surveyed reported that they found engineering turnover a problem in maintaining an efficient engineering staff . . . factors which were mentioned often included: possibilities of independent work, "grass is greener," national anxiety, competitors will pay high prices for our know-how, young engineers moving to obtain wider experience, the human need for change, competition, more money traded for stability and opportunity, military service and piracy, promotion to executive positions, better advancement with larger firms, and aggressive recruiting and advertising by others.
>
> —From "*How to Improve the Utilization of Engineering Manpower*," published, 1952.

Thus we see that the professional method of operation can be and is very successful, and when this is recognized and incorporated by engineers and engineer leaders throughout the United States, our profession will gain the strength and stature it deserves.—***End.***

About the Author . . .

Harold P. Cooper

Harold P. Cooper of Lake Jackson, Texas, is a design engineer in the Engineering Department of the Texas Division of The Dow Chemical Company at Freeport. He is assigned to the Utilities Project Division of the Department, and he has, of course, been a participant in the professional program which he describes in his article.

Born in Dallas, Mr. Cooper attended schools in that city. In 1948, he received his B.S. in civil engineering from the University of Texas in Austin. Following graduation, he worked for three years with the Texas Highway Department—for two, as an inspector on a bridge job in Uvalde, and then as a junior engineer in the Bridge Division in Austin. He joined Dow in May, 1951, starting as a design engineer in the Structural Design Section of the Engineering Department.

Mr. Cooper was instrumental in the formation of the Gulf Coast Chapter of the Texas SPE and served as president in 1954. In addition to NSPE, he belongs to the American Society of Civil Engineers, the Texas Surveyors Association, and the American Congress on Surveying and Mapping.

He is active in civic and church affairs in Lake Jackson. He also served in the Navy from 1944 to 1946.

- Last of Three Parts -

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Ethical Problems—

By FRANCIS S. FRIEL, P.E.,

President, Albright & Friel Inc., Consulting Engineers

THE independent consulting engineer is faced with many ethical problems if he lives up to the Canons of Ethics adopted in 1947 by the Engineers' Council for Professional Development, and the codes of ethics which have been formulated by our national engineering societies.

Engineering ethics is a lively current subject and a great deal of discussion on it has been generated by the recent incident when the State of South Carolina advertised for bids on engineering services. Thirteen engineering firms answered the advertisement with offers to prepare plans and specifications. The bids ranged from 2.9 to 7.5 per cent.

This event in South Carolina has brought to the attention of the independent consultant the subject of professional ethics and practice as related to undesirable procedures for awarding engineering contracts on a price bid basis. The long established position opposing this procedure of awarding contracts was reiterated in a statement of the Board of Direction of the American Society of Civil Engineers in February, 1954. Furthermore, the Council of the American Institute of Consulting Engineers, at its meeting in October 1954, adopted a declaration of policy relating to competitive bidding. It reads as follows:

"The procurement of professional engineering services through competitive bidding on a price basis is a repudiation of the status of engineering as a profession, and the American Institute of Consulting Engineers hereby places itself on record as unalterably opposed to such practice.

"Competitive bidding for engineering services is not in the public interest since it may lead to the employment of the engineer least qualified for the particular work under consideration instead of the best qualified, which should be the objective. The public inevitably suffers from the selection of an unqualified engineer through engineering design which results in uneconomical construction or an unsafe structure.

"The Institute subscribes to the procedure of procuring professional engineering services through negotiation between the principal and the engineer in such a manner that the interests of both parties and the interests of the public, where the public is involved, shall be protected."

The controversy on the South Carolina issue will, no doubt, result in a re-examination of the codes of ethics

of our technical societies. The American Society of Civil Engineers has expanded its Committee on Professional Practice to consider the problem of accepted engineering practice in the matter of competitive bidding; and the Council of the American Institute of Consulting Engineers has likewise adopted a resolution authorizing the appointment of a committee to make an objective statement of accepted engineering practice on this same issue. The results of the work of these two committees, which will coordinate their efforts, should clarify the issue of competitive bidding by the independent consultant; and also establish a satisfactory code of practice.

As a former national director of the American Society of Civil Engineers, and as the current president of the American Institute of Consulting Engineers, the author has listened to many discussions on ethical problems involving competitive bidding and other important ethical matters as they affect the independent consultant, and he feels that competitive bidding is one of the paramount issues involving ethics with which the engineer in private practice is now faced.

Canons and codes of ethics stress honesty, justice and courtesy as a moral philosophy. These three elements constitute the foundation of ethics. Every consultant should acquire these principles to guide him as a faithful practitioner in the performances of his duties if he is to maintain a standard of service to his clients and to his employees. If these principles are followed, the engineer in private practice will minimize his ethical problems; but if they are violated too often, he may get into difficulties, because these principles might be compared to the basic laws of society. You cannot disregard them. If you pass a traffic light too often, you either land in jail, in a hospital or in your grave.

The independent consultant is faced with other ethical questions in addition to that of competitive bidding. The young consultant may avoid the principal pitfalls by observing the following rules: First, he should always act for his clients as a faithful agent or trustee. Second, he should not accept remuneration other than his stated charges for services rendered to his clients. Third, kickbacks are to be condemned. Fourth, he should not offer commissions or otherwise improperly solicit engineering assignments. Fifth, he should not injure the professional reputation of a fellow engineer. Sixth, he should not attempt to supplant another engineer after definite steps have been taken toward his engagement. These basic rules are in the codes of ethics of the American Society of Civil Engineers, the American Institute of Consulting Engineers and the National Society of Professional Engineers, and they involve ethical problems with which the independent consultant may be faced.

From time to time rumors are heard or news articles appear stating that engineering firms which seek assignments on some municipal or state projects are faced with the problem of demands being made upon them by persons with influence. This is a dishonest practice and is a violation of all ethical principles. The author

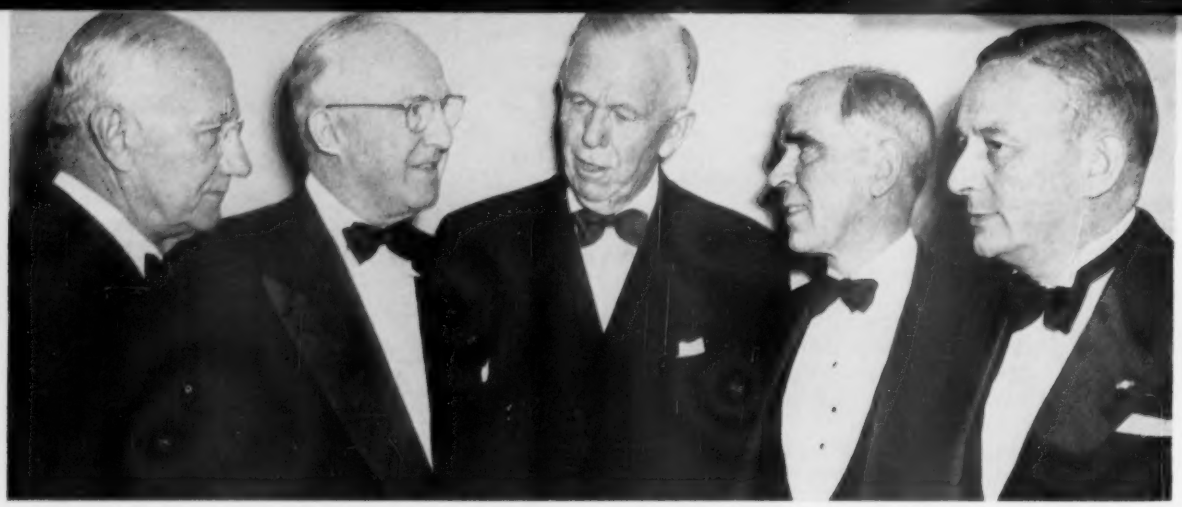
does not feel that this is universal practice, and the profession as a whole should not be condemned for the action of a few. In his thirty-three years of practice as an independent consultant carrying out a large number of assignments in the municipal, state and Federal fields, the author has never been approached for the payment of a fee for influence to assist in obtaining an engineering assignment.

Rumors have prevailed from time to time to the effect that engineers have been paid a so-called "commission" for specifying certain materials and equipment. These rumors may be false, but where there is smoke, there usually is some fire. It is felt that this unethical procedure may be followed by some few individuals in the consulting field, but not many. The author has knowledge of one engineer who violated the ethics of the profession by following this practice. He landed in jail, not because he had accepted commissions from

either manufacturers or materialmen, but because he had not reported the "commissions" on his Income Tax Return.

The author also has definite knowledge of an independent consultant who made a practice of charging a fee, to a construction contractor on his own job, for staking out work consisting of sewer and water lines, while his client thought that the fee he was paying the consultant was for complete service, including the stake-out of the work. This practice, of course, is to be condemned; but, unfortunately, is followed by some engineers.

As a member of the State Registration Board for Professional Engineers in the Commonwealth of Pennsylvania, the author's attention has been called to many



The author, second from left, chats with Horace Liversidge, chairman of the board, Philadelphia Electric Co.; General George Marshall, U. S. Army, Retired, and former Secretary of State; James Creese, president, Drexel Institute of Technology; George Bidault, Foreign Minister from France. All were speakers at a convocation at Drexel.

unethical practices on the part of independent engineers. An outstanding case involved one engineer using the plans of another by having them reproduced and then changing the name of the engineer who originally prepared the drawings to his own. This practice is improper.

Several cases have been cited relative to a consulting engineer promoting a patented process. For example, it is a fact that an independent consultant promoting a certain patented sewage treatment process has been known to approach a client of another engineer, after plans have been drawn, with a proposal that his patented process will cost less than the plant designed by his fellow engineer. This procedure is unethical.

The canons and codes of ethics invariably contain a provision relating to engineers associating with one another in a joint enterprise. Occasionally attention is focused on a consultant of high ethical principles who becomes associated with another engineer whose standards of practice are questionable. Such a relationship is not to be condoned.

A most important provision is contained in the ECPD Canons of Ethics. It states that "An engineer shall not be financially interested in the bid of a contractor on competitive work for which he is employed as an engineer, unless he has the consent of his client or employer." It is the feeling of the author that a practicing consulting engineer should not, under any circumstances, be interested financially in a contracting firm.

In rendering professional service to a client an engineer who is working for an inadequate fee might make his designs and prepare his plans and specifications in such a way as to save money for himself at the expense of his client. This practice will inevitably result in the client's paying a larger cost for the construction of the project, because slipshod engineering work always results in "extras" for the contractor. It is the author's opinion that it is unethical to accept an assignment and then render inadequate engineering service even though the fee is not sufficient. You cannot cut prices and still do good work. The theory "you only get what you pay for" is not applicable. The fees which were proposed in the South Carolina case amaze the author. All engineers in private practice know that the cost of performing professional service does not vary from 2.9 to 7.5 per cent. It appears that the service intended to be rendered by each firm was different because the low fee surely would not have been sufficient to provide the same engineering service as the high fee.

THE author's attention has just been called to a news item appearing in a Pennsylvania paper captioned, "Borough Council Again Debates Sewage Problems." In discussing this problem which involved the preparation of a preliminary feasibility report, the Borough Council evidently met with a representative of a consulting engineering firm. The following is quoted from the news article, "A representative of the ..... firm returned to Council and pleaded for approval of his revised offer of $2500.00 for such a survey, which originally had been estimated at $7500.00." This firm cut its price from $7500 to $2500 to secure this assignment, and surely they could not render the same engineering service for the reduced price. This price cutting

The author, right, and Mr. Clarence Connor, view the water works project for the City of Chester, Pennsylvania.

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An Added Feature in the . . .

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Every year the February AMERICAN ENGINEER is designated as NATIONAL ENGINEERS' WEEK ISSUE. Again, during 1956, the week of Washington's Birthday, February 19-25, will be celebrated as National Engineers' Week. The theme will be "Engineering—Builder of a Brighter Future." This annual observance honors the professional engineer for the great contribution he has made to the American way of life. The week will be observed across the nation by the President, State officials, governors, mayors and civic leaders. Many of the nation's leading firms will participate with special radio and TV programs, spot announcements, poster displays and like activities. The NATIONAL ENGINEERS' WEEK ISSUE of the AMERICAN ENGINEER will feature these activities for its more than 35,000 registered professional engineer readers. This timely issue will reach your TOP engineering market *(78.4% buy or specify)* during the first week of February.

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Please list us in the Professional Engineers' Buyers Guide under the headings checked on the other side of this sheet.

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- Flooring
- Floor Tile
- Glass Blocks
- Heating and Vent. Equip.
- Heating Panels
- Insulation
- Lath Boards
- Lighting Fixtures
- Lime, Building
- Lumber
- Marble
- Metal Ceilings
- Paints, Varnishes
- Plaster, Gypsum
- Plumbing Fixtures
- Radiators
- Roofing, Guttering
- Scaffolding
- Screens
- Sheathing
- Shingles
- Siding and Building Papers
- Slate
- Steel, Structural
- Stone
- Storm Windows and Doors
- Tapestry Brick
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- Aircraft Ground Support Equipment
- Alarm Systems
- Aluminum
- Antenna Systems
- Architects Supplies
- Artists Supplies
- Automatic Control Panels
- Automobile Accessories
- Badges
- Ball Bearings
- Batteries
- Belting, Machinery
- Blast Cleaning Equipment
- Blasting Equip., Materials
- Blowers
- Blow Torches
- Blue Print Papers
- Boilers, Accessories
- Boiler Feed Systems
- Bonds (Surety)
- Bookkeeping Machines
- Books, Technical, Scientific
- Brake Linings
- Brass Equipment
- Calculating Machines
- Calipers
- Cameras
- Castings
- Chair Lifts
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- Chemicals, Industrial
- Chemicals, Sewage Treatment
- Cleaning Equipment & Chem.
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- Coatings
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- Computers
- Concrete Additives
- Concrete Equipment
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- Cores, Powdered Iron
- Corrosion Inhibitors
- Cranes
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- Dehydrators, Air
- Diesel Engines
- Diodes
- Disinfectants
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- Electrical Supplies
- Electromagnetic Devices
- Electronic Communication Equipment
- Electronic Computers
- Electronic Equipment
- Elevators
- Engineers Supplies
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- Engines, Steam
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- Explosives
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- Flashlights
- Floor Coverings
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- Food Processing Equipment
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- Fountain Pens
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- Gauges
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- Hose
- Hydraulic Equipment
- Hygienic Instruments
- Incinerators
- Ink
- Insecticides
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- Instruments, Testing
- Intercoms
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- Levels
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- Liquid Gas Pumps
- Liquid Level Controls
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- Lubrication Systems
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- Machinery Mountings
- Machinery, Special
- Magnesium
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- Marine Oils
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- Materials, Testing
- Measuring and Controlling Instruments
- Measuring Tapes and Rules
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- Micrometers
- Moisture Control Equipment
- Motor Oils
- Motor Trucks
- Name Plates
- Needle Bearings
- Office Equipment
- Office Furniture
- Office Supplies
- Oil Burners
- Oil (Lubricating)
- Oil (Paint)
- Ovens, Industrial
- Packaging Equipment
- Packing—Mechanical
- Paint Brushes
- Paint Sprayers
- Parts, Precision
- Paving Materials
- Pencils, Drafting
- Pens, Drafting
- Photocopiers
- Piling, Sheet
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- Pipe, Clay
- Pipe, Concrete Pressure
- Pipe, Iron
- Pipe, Steel
- Plastic Coated Tubings
- Plastics
- Polyester Resins
- Power Transmission Equip.
- Precision Castings
- Precision Instruments
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- Pressure Vessels
- Public Address Equip.
- Pumps
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- Radiators
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- Resistors
- Roller Bearings
- Rotameters
- Safes
- Safety Equipment
- Saws
- Scales
- Scientific Instruments
- Seals, Pocket
- Sewage Treatment Materials
- Sewerage
- Shafting, Flexible
- Sheet Metal
- Shock Absorbers
- Silos
- Slide Rules
- Smoke Control Systems
- Soil Sampling Equip.
- Sound Systems
- Stainless Steel
- Steel (Other than structural)
- Stokers
- Supplies (Machinery)
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- Trailer Accessories
- Trailers
- Transformers
- Transits
- Truck Equipment
- Truck Bodies
- Trucks, Motor
- Tubing
- Tubing, Corrosion Resistant
- Valves & Fittings
- Vibration Controls
- Waste Treatment Equipment
- Water Conditioning Equip.
- Water Control Apparatus
- Water Treating Chemicals
- Welding Electrodes (Alloy)
- Welding Equipment, Supplies
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- Wire Fabric
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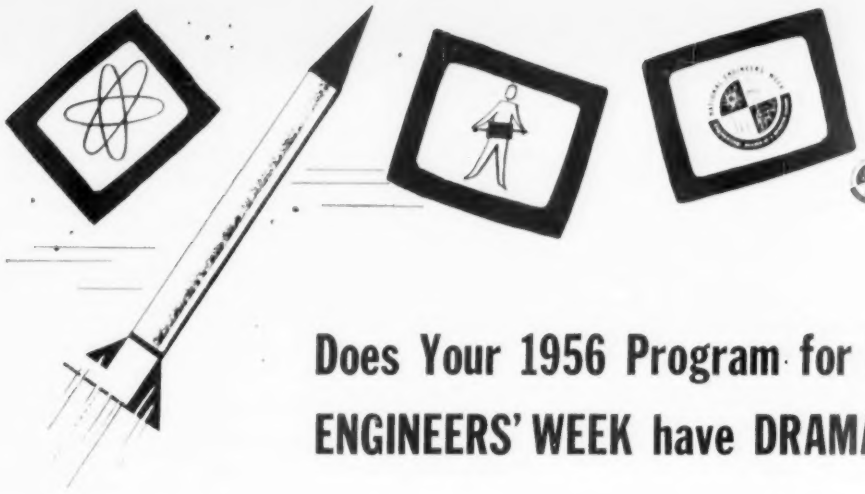

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It will have if your chapter takes advantage of these expertly prepared aids for dramatizing the story of engineering in our modern world. Here are the basic promotional materials that will help every chapter build a successful Week's observance. Use the order coupon below.

1. FIVE 1-MINUTE TV FILMS: This set of 1-minute "spot" films will get your chapter's National Engineers' Week message on TV screens throughout your local area. Filmed in a top studio under expert direction, the films feature experienced TV network performers. The five films are designed to dramatize outstanding accomplishments of engineering for a general audience. They cover the engineering contributions to atomic energy, radar, air transportation, space satellites, and construction. All five will qualify for public service time during TV station "breaks." Price: Set of five films, $25.

2. "PROJECT SATELLITE—AN ENGINEERING STEP TO OUTER SPACE:" This is a 15-minute tape recorded radio show that tells the engineering story behind the planning and construction of the proposed earth satellite. It features President Eisenhower's press secretary, James Hagerty, making the White House announcement that the U. S. would build a satellite, and a talk by Dr. Fred Singer, the University of Maryland physicist whose calculations for the MOUSE project have been widely discussed in scientific circles. A dramatic public service program with radio network voices. Price: $7.

3. SET OF SEVEN TV SLIDES: Here is a chance to get TV coverage every day during the Week. These expertly prepared slides are designed for use on TV station breaks. They feature poster-type art work and printed copy calling attention to engineering and the Week's observance. Price: $10 per set of 7.

4. POSTERS: Colorful 10½ x 10½-inch coated cardboard posters carrying the 1956 Engineers' Week emblem. Prime necessities for bulletin board, window, and other displays. Large-size (22½ x 22½-inches) also available. Prices: 10½-inch, $4 per 100; 22½-inch, $5 per 100.

5. PAPER BANNERS: Excellent for display use. Three feet long by 6 inches wide. Has poster design and words "National Engineers' Week," in color. Price: $4 per 100.

6. ENGINEERS' WEEK SEALS: Use these brightly colored seals on all your mail from now through Engineers' Week. Poster design printed on 1½-inch gummed paper. Price: $3 per 1000.

7. NEWSPAPER MAT STORY ON SPACE SATELLITE: A feature article on the engineering behind man's first step into outer space. Prepared on mat, ready for immediate insertion in daily or weekly newspaper. Price: 50¢ each.

8. NEWSPAPER MAT STORY ON GEORGE WASHINGTON AS AN ENGINEER: A feature article, with illustration, based on fresh material gathered by writer visiting Washington's Mount Vernon home. Ready for immediate newspaper insertion. Price: 50¢ each.

9. LOGOTYPE: A metal cut of poster design to insert in advertisements, printed matter, etc. All state society and chapter publications should have one. Excellent for use in industrial house organs and other publications. Price: $1.50 each.

10. "THE USS NAUTILUS—AN ENGINEERING AGE TRIUMPH:" A re-issue of the 15-minute tape recorded radio program distributed last year. Just as timely this year, if your chapter did not use it in 1955. Tells the engineering story behind the first atomic powered submarine. Price: $5.

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- ☐ 3. TV slides. Set of 7 slides, @ $10 per set.
- ☐ 4. Posters, regular size @ $4 per 100. Posters, large size, @ $5 per 100.
- ☐ 5. Banners @ $4 per 100.
- ☐ 6. Seals @ $3 per 1000.
- ☐ 7. Newspaper mat story on space satellite @ 50¢ ea.
- ☐ 8. Newspaper mat story on Washington as engineer @ 50¢ ea.
- ☐ 9. Logotypes @ $1.50 ea.
- ☐ 10. Radio tape, "The USS Nautilus—An Engineering Age Triumph," @ $5 ea.

1956-57 Nominees Are Announced

An Arkansas man, long prominent in the affairs of the National Society of Professional Engineers, has been selected by the NSPE Nominating Committee to head the 1956-57 slate of candidates for Society office. The presidential nominee is Robert J. Rhinehart of Pine Bluff, currently serving as vice president for the NSPE Southwestern Region. He is a division superintendent of the Arkansas Power & Light Company in charge of transmission and distribution systems in a large area of the State.

Vice presidential candidates also named by the Committee are: A. H. Kidder, Northeastern Region; Warner Howe, Southeastern Region; Harry G. Kennedy, Central Region; Garvin H. Dyer, North Central Region; Clark A. Dunn, Southwestern Region; and L. R. Durkee, Western Region.

In announcing the names of the candidates, the Committee also pointed out that additional nominations may be made by members as provided in the Constitution. Other names will be placed on the official ballot upon petition of fifty members, all in good standing, provided such petition is received at least one week prior to the printing of the ballot. The closing date for such petitions, which should be sent to NSPE's Washington office, will be January 10, 1956.

Members of the Nominating Committee are: T. Carr Forrest, Jr., chairman, and Ezra K. Nicholson, Wallace J. McRoy, Robert Williamson, Jr., Brandon H. Backlund, and Walter A. Burg.

Following are brief biographical sketches of the Committee's choices for NSPE leadership.

Robert J. Rhinehart

Robert J. Rhinehart of Pine Bluff, Arkansas, nominee for the 1956-57 NSPE presidency, is a native of Plymouth, Indiana, and a graduate of Purdue University from which he received a B.S. in electrical engineering in 1922 and an E.E. degree in 1926. Since 1925, he has been registered under the laws of Arkansas where he is now division superintendent with Arkansas Power & Light.

Now in his second term as a National Society vice president, Mr. Rhinehart is supervising the activities of the Young Engineers Committee and the Education Committee as well as serving as chairman of the Registration Committee. In the past, he has also been a national director from Arkansas and has been active in the chairmanship of other NSPE committees.

He has been a member of the Arkansas State Registration Board for Professional Engineers for seven years and is now serving as president for the third year. He has been chairman of the Uniform Laws and Procedures Committee of the National Council of State Boards of Engineering Examiners, and he is also a past chairman of the Arkansas Section of the AIEE.

In addition to his engineering activities, Mr. Rhinehart has participated extensively in civic affairs. In 1939 he was elected "Our Leading Citizen" by the people of Pine Bluff. He is a charter member of his Kiwanis Club, and he has been chairman of both the Pine Bluff Park Commission and the Pine Bluff Planning Commission. Very active in youth work, he has been president of the Arkansas Society of Crippled Children.

Allan H. Kidder

Allan H. Kidder of Philadelphia, nominated as vice president for the Northeastern Region, is a graduate of M.I.T., from which he received B.S. and M.S. degrees in electrical engineering. Since 1923, he has been employed by the Philadelphia Electric Company where he is presently in charge of the Testing Division.

Active in chapter and state activities, he was president of the Philadelphia Chapter in 1951 and vice president of the Pennsylvania SPE in 1950. He also served as a national director in 1952-55, and has held various NSPE committee chairmanships. Since 1954, he has been a member of the NSPE-EJC Liaison Committee.

Mr. Kidder is a fellow of the AIEE. He is a director of The Engineers' Club of Philadelphia; secretary of the Philadelphia Council, ASTM; and chairman, Cable Engineering Section, Association of Edison Illuminating Companies.

Warner Howe

Warner Howe of Memphis, Tennessee, vice presidential nominee for the Southeastern Region for a second term, is a partner in the firm of Gardner & Howe, Memphis structural engineers. A 1941 civil engineering graduate of Cornell University, Mr. Howe has worked with the U.S. Army Corps of Engineers in a civilian capacity in the Panama Canal Zone, and he also served as a lieutenant, j.g., with a U.S. Navy construction battalion in the Pacific Theater from 1942 to 1945.

He was a charter member of the Tennessee SPE and is a past president of the Memphis Chapter. He has served as a director of the State Society and as an NSPE national director. He is now chairman of the Budget Committee and supervises the Activities Group of NSPE committees.

Mr. Howe is also an active member of the American Society of Civil Engineers, the American Concrete Institute, the Rotary Club, and the Memphis Engineers Club.

Clark A. Dunn

CLARK A. DUNN of Stillwater, Oklahoma, candidate for the Southwestern Regional vice presidency, is the executive director of the Division of Engineering Research and a professor of civil engineering at the Oklahoma Institute of Technology, Oklahoma A&M College. He was born in Stickney, South Dakota, in 1901, and his educational record includes a B.S. in civil engineering received from the University of Wisconsin, C.E. and M.S. in C.E. degrees from Oklahoma A&M College, and a Ph.D. in civil engineering from Cornell University.

Dr. Dunn was president of the Oklahoma SPE in 1948, and he is currently serving on the NSPE Board of Directors. He is also a member of the American Society of Civil Engineers, the American Society for Engineering Education, Phi Kappa Phi, Sigma Tau, Chi Epsilon, and various civic groups. He is listed in *Who's Who in America*.

Lindley R. Durkee

LINDLEY R. DURKEE, candidate for a second term as vice president of the Western Region, is the area representative for the Housing and Home Finance Agency in Seattle. A native of Colorado who now makes his home in Mercer Island, Washington, Mr. Durkee is a graduate of Montana State College with a B.S. in A.E. and also holds an honorary doctorate.

He has served in the U.S. Navy, has been a construction superintendent for various projects in the Pacific Northwest, and has been in the employ of the Federal Government since 1933.

He is a past president of the Washington SPE and of the Seattle Chapter and a former NSPE national director. Currently he is directing the Public Relations Group of NSPE committees. He is a member of the Bonneville Regional Advisory Council, the SAME, and the American Society for Public Administration.

Garvin H. Dyer

GARVIN H. DYER of Independence, Missouri, nominated for a second term as vice president of the North Central Region, has been manager and chief engineer of the Independence Division of the Missouri Water Company since 1947. Previously he was assistant superintendent and engineer with the Springfield City Water Company.

Mr. Dyer, who received his education through private study and I.C.S. courses, is a past president of the Missouri SPE and has served on its Board of Directors, as well as having been chairman of its Ozark and Western Chapters. He is a former member of the NSPE Board, and now supervises the Professional Practice Group of committees.

He is an honor member of Chi Epsilon, past president of the Mid-Missouri Section of ASCE, and a former chairman of both the Missouri Section of the American Water Works Association, and the Missouri Water and Sewerage Conference. He received the latter organization's Award of Merit for 1954. He is also a member of the Kansas City Engineers Club, Lions Club, the Chamber of Commerce, and various Masonic bodies.

Harry G. Kennedy

HARRY G. KENNEDY of Charleston, West Virginia, nominee for vice president of the Central Region, is executive secretary of the Kanawha Coal Operators' Association, a position he has held since 1941. From 1932 to 1941, he was labor commissioner for the Association; and prior to 1932, he was a combustion engineer with the Carbon Fuel Company and the Wyatt Coal Company. In 1944, he served as a labor consultant to Secretary of the Interior Harold Ickes.

A graduate of West Virginia University, having received a B.S.E.M. degree in 1926 and an M.S.E.M. in 1928, Mr. Kennedy is coauthor of the University Research Bulletin No. 4, *Mining Methods in West Virginia*.

Active in the Charleston Chapter and the West Virginia SPE, he served as president of the latter in 1947. He is now completing his second term as a NSPE national director, and is also chairman of the Legislation Committee.

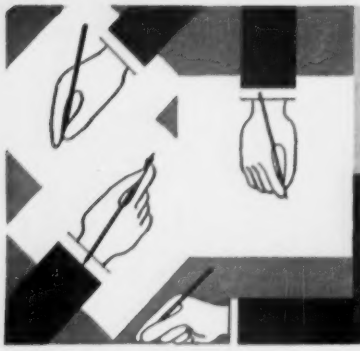
Mr. Kennedy is chairman of the Coal Producers Committee for Smoke Abatement and also of the Advisory Committee on Scientific, Engineering and Specialized Personnel for West Virginia Selective Service. He is a member of AIME and civic and professional groups.

Russell B. Allen

RUSSELL B. ALLEN, nominated for a ninth term as treasurer, spent his early years in New Haven, Connecticut, and received his B.S. in Civil Engineering from Yale in 1923. After teaching at Yale, he spent several years with the Boston & Maine Railroad as a construction engineer and two years in private consulting practice. His association with the University of Maryland began in 1933, and he was given the title of full professor in 1945.

Registered in both Maryland and Connecticut, he has been active in the affairs of the Maryland SPE, having served as secretary-treasurer, as president, and as a national director to NSPE.

He is a member of Tau Beta Pi, Sigma Xi, Omicron Delta Kappa, and several other engineering societies, including the American Society for Engineering Education.



Professional POSTSCRIPTS

This month the —PP— "platform" is turned over to the controversial subject of corporate practice of engineering. In the past we have presented both sides of this issue and we will continue to do so as long as reader interest is high. This month's presentation, favoring corporate practice, has been prepared by Engineer J. K. Gannett, Vice President, The Austin Company, who is acting as Chairman of the Committee on Engineering Laws. Here, then, is "a program for the engineering profession as seen by CEL."

—PP—

The present Committee on Engineering Laws, comprising some 50 members, has been formed by a group of engineering corporations to continue the efforts which eight such corporations initiated in the fall of 1952. The membership includes large corporations of different states whose operations are national in scope, as well as several smaller organizations which are also vitally interested in the activities of CEL. The Executive Committee* is composed of representatives of member corporations.

The corporations comprising this Committee have several objectives, all of which are concerned with high standards in the engineering profession, the first and most important one, at this time, being to secure satisfactory legislation providing for what has become known as the corporate practice of engineering in those states where present laws are silent, ambiguous or unduly restrictive. To the members of CEL, satisfactory legislation necessarily means adequate safeguards in the laws for the protection of the public's health, safety and property. Such laws should also provide freedom of choice as to where and for whom individual engineers may work; freedom of choice of the type of business under which engineers may choose to conduct their practice; and freedom of choice for industry and governmental administrations to select the best type of engineering organizations required to meet their varied problems.

This Committee's ideas as to adequate safeguards for the public are well expressed in the following excerpt from the law passed in 1955 and now on the statute books of Missouri. In that state a corporation may obtain a certificate of authority from the Registration Board provided that:

"(a) at all times during such authorization the directors of such corporation shall have assigned responsibility for the proper conduct of all architecture or professional engineering activities of such corporation to an officer of such corporation of at least the rank of vice-president, who is a professional architect or engineer, as the case may require, duly registered as such in this state or registered or licensed in any other state whose requirements for such registration or licensing shall have been substantially equivalent to the requirements for registration in this state at the time such registration or license was issued in such other state; (b) the person or persons in responsible charge of the architectural or professional engineering activities of such corporation in this state shall be registered to practice architecture or professional engineering as provided in this chapter; (c) all plans, specifications, plats and reports prepared by and on behalf of any such corporation shall be signed by the registered architect or professional engineer by whom or under whose supervision they were prepared, when issued for filing with public officials within the state; and (d) such corporation pays such fees for authority renewal, or reinstatement of authority or reauthorization as may be required by law. The board may require such corporation to execute, deliver and file in the office of the board a surety company bond in an amount not exceeding $50,000 to be fixed by the board, conditioned for the faithful and honest conduct of its business by such corporation, which surety bond must be written by a company recognized and approved by the superintendent of insurance of the state, and approved by the board with respect to its form, manner of execution and reasonable sufficiency."

CEL believes that safeguards such as these provide complete recognition of the engineering character of the profession and yet provide proper protection for the public welfare in connection with corporate practice, due to the action required by boards of directors, the professional responsibility of the engineer, and the requirement for a type of character reference, if the state board so desires, by the provision relating to a surety bond.

The members of this Committee will co-operate with the various engineering societies in establishing a Code of Practice so that the highest standard of practice—both for the corporations and individuals—would be clearly stated and understood in the engineering profession. This is a long-range problem for concerted action which this Committee is willing to aggressively support, although it recognizes that these matters pertaining to the engineering profession properly come under the leadership of one of the societies, or a joint committee of the societies.

***J. K. Gannett, B.S.C.E., P.E., Chairman**
Vice President, The Austin Company, Cleveland, Ohio

M. P. Anderson, B.S.C.E., P.E.
Vice President, Brown & Root, Inc., Houston, Texas

R. A. Blackburn, B.Met.E., M.Sc. in Met., P.E.
Contract Engineer, Koppers Company, Inc., Pittsburgh, Pa.

R. T. Branch, M.E., D.E., P.E.
Chairman of the Board, Stone & Webster Engineering Corporation, New York, New York

W. H. Byrne, M.E., P.E.
President, Byrne Associates, Inc., New York, New York

J. Delano Hitch, P.E.
President, Dorr-Oliver Incorporated, Stamford, Connecticut

Benn Wainwright Jesser, B.S.E., M.S.Ch.E., P.E.
Manager of the Design Engineering Department, The M. W. Kellogg Company, New York, New York

F. E. Lyford, M.E., P.E.
Executive Director, Committee on Engineering Laws, New York, New York

K. W. Reece, B.S.C.E., P.E.
Vice President, Ebasco Services Incorporated, New York, New York

Lee Van Horn, B.S.Ch.E., M.S., P.E.
Vice President, The Fluor Corporation, Ltd., Los Angeles, California

E. F. Wentworth, Jr., LL.B.
General Attorney, Foster Wheeler Corporation, New York, N. Y.

CEL feels that some of the present practices as to competitive bidding for pure engineering are bad. Probably this should be covered at the time the proposed Code of Practice is studied. The Committee on Engineering Laws is in favor of all qualified engineers becoming licensed or registered, and approves engineer-in-training programs.

It is also believed by CEL that reciprocity of registration among the various states should be extended.

There may be other avenues of co-operation between CEL, the individual engineer, and the engineering societies which would bring about an end result that would benefit the entire engineering profession.

All these things can be brought about provided there is satisfactory legislation so that engineering corporations may legally practice engineering in all of the states—not just some of them—and, thereby continue to freely serve their clients' needs, thus providing more work and better opportunities for members of the engineering profession.

—PP—

—PP— thinks that corporate practice of engineering will be debated for some time to come. As readers probably know, NSPE has taken no official stand in this matter, but individual members should give both sides of the question much thought. Why not write —PP— and set down your views? Merry Christmas!

NSPE Committees Review Responsibilities And Progress

November was a busy month at NSPE's national headquarters in Washington as the members of various national committees met to review their over-all responsibilities, assess the progress of current programs, and consider specific plans for future activities.

The Education Committee and the Registration Committee both held meetings on November 19 in Washington, while members of the National Affairs Committee assembled for a two-day meeting on the 25th and 26th of the month.

One of the items which concerned the Education Committee was the drafting of preliminary plans for a day-long conference on engineering education which will be a feature of the NSPE Annual Meeting scheduled for Atlantic City, New Jersey, May 24-26. Plans are also under way in three other national committees for holding day-long sessions in their particular fields of interest simultaneously with the education group during the Atlantic City meeting. The other committees arranging full-day programs are the Engineers in Industry Subcommittee and the Engineers in Government Subcommittee of the Employment Practices Committee and the Engineering Practices Committee.

The Engineers in Industry Subcommittee also held a two-day meeting in Pittsburgh on the 18th and 19th of the month.

Robbins Completes Western Tour Of NSPE Societies

NSPE Executive Director Paul H. Robbins has recently completed an extensive tour of the West, visiting chapters and state societies as well as a number of professional engineering groups, including the Montana Society of Professional Engineers, which are not affiliated with NSPE. **(For photo, see page 35).**

Speaking at most of the meetings he attended during the course of his trip, Mr. Robbins received widespread press coverage, particularly in reference to his comments on the need to insure the maintenance of competent math and science faculties in the country's high schools and on the dangers inherent in efforts directed toward the unionization of professional men. He also explained the policies and service activities of the National Society in the various addresses which he made.

In addition to Montana, his itinerary took him to Texas, Arizona, California, Oregon, Washington, Nevada, Idaho, and Utah. While in Dallas, Texas, he conferred with local engineers on preliminary plans for the 1957 Annual Meeting of NSPE, which will be held in that city in June.

Past Pres. Shoch Designs "Professional" Xmas Card

Because it deserves commendation, and because other readers may like ideas for their own personal Christmas cards, the AE reprints below the card used last year by NSPE Past President Clarence T. Shoch of Allentown, Pa.

The design on the left was used for the cover and the inside of the greeting card, when opened, is pictured below. The copy strongly stresses the "service" appeal of the NSPE but at the same time retains the dignity of the season.

The SPACE Satellite Will Be In The News!

And so will your National Engineers' Week program if your chapter takes advantage of the one-minute TV films offered by NSPE . . .

Here is an opportunity to get the dramatic impact of professional engineering on TV screens throughout your local community. The series of 5 one-minute films available from NSPE this year has been designed to dramatize, through sound and pictures, the significant contributions made by engineers to our modern civilization. These expertly prepared public service films are built around such things as radar, atomic energy, transportation, space satellites, and bridge construction.

Produced according to broadcasters' specifications, the films feature experienced network TV performers. All five films will qualify for use on public service time during television "station breaks." Each film strip is reeled on a separate core, ready for immediate showing.

Order your set of five films now from NSPE headquarters.

Price: $25 per set.

(See full-page ad in this issue for other promotional aids for National Engineers' Week available from NSPE.)

Special AE Issue Planned For Feb.

Plans are going forward by the NSPE Publications Committee for the special February issue of the AMERICAN ENGINEER. Devoted to the National Engineers' Week theme, "Engineering . . . Builder of a Brighter Future," the February magazine will feature a series of articles by-lined by some of the Nation's most prominent engineers who will take a look at the future in their particular fields.

The articles will deal specifically with "Tomorrow's Engineer" in production, research, top management, Government, the armed forces, and possibly also in public affairs and education. The lineup of authors will include Arthur F. Vinson, vice president—manufacturing, General Electric Company; Dr. Charles N. Kimball, president, Midwest Research Institute; Major General William M. Creasy, chief chemical officer, United States Army; The Honorable Wilbur A. Dexheimer, United States Commissioner of Reclamation, and others.

Another special feature planned for the February issue is the Professional Engineers' Buyers Guide. The annual publication of this Guide (see page 25) provides manufacturers with an opportunity to have their products listed in a medium reaching more than 35,000 registered professional engineer readers, 78.4 per cent of whom buy or specify. Interested manufacturers should reserve space in the Guide now through the AE advertising representatives listed in the front of the magazine or by writing to the national headquarters office.

The February magazine will also include all regular features and AE departments.

DECEMBER MEETINGS Of Note

American Association of State Highway Officials—Annual Meeting, December 4-10, New Orleans, Louisiana.

American Institute of Chemical Engineers—International Atomic Exposition, December 10-16, Cleveland Municipal Auditorium, Cleveland, Ohio. In conjunction with EJC Nuclear Engineering Congress. (See below.)

Engineers Joint Council—Nuclear Engineering and Science Congress, December 12-16, Cleveland Municipal Auditorium, Cleveland, Ohio.

N.S.P.E. Believes

SCIENCE AND OUR HIGH SCHOOLS

BY PAUL H. ROBBINS, P.E.

Executive Director

N.S.P.E.

Two reports have recently been released carrying a wealth of information of deep concern to NSPE, its state societies and chapters.

The first is a report of the National Science Foundation, on scientific personnel resources. Filled as this report is with much statistical information, the statistics pertaining to the enrollments in physics in high schools are particularly noteworthy. They show, for example, that while 8 per cent of the students enrolled in high school in 1922 were taking physics, this percentage had decreased to only 5.4 per cent in 1949. Even so, the report indicates that 412,401 high school students were enrolled in physics courses. Through other statistics, the report shows that high school enrollments had increased in 1955 over the 1949 level by some 15 per cent, and it is estimated that the increased high school enrollments in 1960 will be more than 40 per cent over the 1949 enrollments.

The second report, issued almost simultaneously with that of the National Science Foundation, comes from the American Association for the Advancement of Science. This report indicates that in 1955, only 249 men and women graduated from our colleges and universities prepared to teach high school physics. The AAAS report goes on to point out that at least half of these 249 physics teachers, for one reason or another will not actually take up high school teaching. The alarming conclusion is obvious that 125 new physics teachers are far too few to meet even a dwindling demand for physics teaching at the high school level.

This is merely another set of figures to impress upon us a matter of deep concern to the engineering profession. It will be recalled that NSPE President Allison C. Neff took notice of this situation by addressing a letter to the publishers of the daily newspapers throughout the country, urging that this distressing problem be called to the attention of the public at large through the public press. The response to President Neff's letter has been most gratifying. Newspapers, large and small, have responded by carrying news stories, feature articles, editorials, and special local surveys calling the attention of Mr. and Mrs. Average Citizen to our problem of teaching science and mathematics at the high school level.

NSPE, of course, is only one of many organizations of engineers and scientists to which this problem is of deep concern. The American Association for the Advancement of Science has been endeavoring to work with all scientific organizations in publicizing these facts. For closer coordination with the AAAS, at its June meeting the NSPE Board of Directors approved making applications for affiliate status in the AAAS. NSPE believes that through this cooperative activity each organization will be able to help the other. AAAS, through its development of material and publicity, will be able to supply NSPE with facts and information of assistance to its chapters and state societies; NSPE, correspondingly, with its local chapters, can be effective in transmitting this information to local organizations, school authorities, Parent Teacher Associations, etc., which are vitally concerned with this problem. In many areas, the local chapter of NSPE, composed as it is of all types of engineers, is one of the most effective media in publicizing these important statistics.

A real public service can be rendered by NSPE chapters, in presenting at every opportunity offered a discussion on the importance of the role of science in modern living. The most vivid dramatization, of course, occurs through the direct application of engineering principles which are evident at every turn. The forthcoming celebration of National Engineers' Week, February 19-25, 1956, provides each chapter with the incentive, the organization, and the opportunity not only to publicize the tremendous contributions of the engineering profession, but also to be of real public service in pointing up the need for civic attention to the important problem of teaching science and mathematics in our high schools.—***End.***

STRICTLY BUSINESS

Personalities . . . **Lieutenant General Lewis A. Pick,** retired chief of the Corps of Engineers, United States Army, has been elected chairman of the board of directors of the **John J. Harte Company,** architects, engineers, and construction managers of Atlanta, Georgia. He will devote his attention to major foreign construction projects, as well as domestic highway, port, and industrial developments. . . . **Frederick S. Rich,** formerly senior instrument engineer for **Arabian American Oil Company,** has been appointed petroleum industry coordinator for **Fischer & Porter Company,** Hatboro, Pa. . . . Election of **R. L. Clark** as president of **Strong Steam Specialty Manufacturing Company,** wholly owned manufacturing subsidiary in Conneaut, O., of the **Strong, Carlisle & Hammond Company,** has been announced. . . . The appointment of **K. W. Tantlinger** as director of engineering research for the **Waterman** and **Pan Atlantic Steamship Corporations** has been announced in Mobile, Ala.; the two steamship lines are subsidiaries of **McLean Industries, Inc.** . . . **Barge-Waggoner, Inc.,** Nashville, Tenn. engineering firm, has announced the addition of **Billy T. Sumner** to its staff of civil engineers as a member of the firm.

Gen. Pick

Edward A. Nixon has been appointed chief engineer of the **Jamison Cold Storage Door Company,** Hagerstown, Md. . . . **Dietrich K. Hausen,** former chief project engineer in multi-channel microwave systems research for the U. S. Army in Europe, has been appointed director of the Electrical and Electronic Laboratories of the **Commonwealth Engineering Company,** Dayton, O., according to **Malvery J. Hiler,** president. . . . **Dr. Theodore von Karman,** senior scientific adviser on aeronautics to NATO and the United States Air Force, has been named a director of **Gruen Precision Laboratories, Inc.,** newly formed subsidiary of the **Gruen Watch Company** of Cincinnati, according to **Edward H. Weitzen,** president of the parent corporation. . . . **Frank C. Amsbary, Jr.,** formerly of Champaign, Ill., has been named manager of the **Long Island Water Company** in New York City. He is being succeeded as general manager of the **Northern Illinois Water Company** in Champaign, of which he was also a vice president, by **Edward M. Healy.** . . . **Joseph W. Calby** has joined the Newark office of **Acheson Industries, Inc.,** as assistant to the technical director, **Raymond Szymanowitz.**

Mr. von Karman

Michael Baker, Jr., president of the international consulting engineering firm, **Michael Baker, Jr., Inc.,** with headquarters in Rochester, Pa., has announced the appointment of two vice presidents: **Richard A. Haber,** vice president — contract development division, and **Joseph F. Bontempo,** who continues as an architect associate with the firm. . . . The **New York Air Brake Company,** New York City, has named **Frederick L. Guyette** to the post of chief plant and equipment engineer. . . . **Edward O. Edney, Jr.,** has been appointed project manager for the nuclear power program of the **Westinghouse Electric Corporation's** Steam Division, South Philadelphia, Pa.; while **Harvey T. Harrod** has been named manager of government contract administration for the Electronic Tube Division, Elmira, N. Y. . . . The appointment of **Herbert A. Merrill** to the position of chief inspector, quality control, has been announced by **Harmon Hugo,** general manager, **Portland Copper and Tank Works, Inc.,** South Portland, Maine.

Mr. Guyette

Contract . . . **The Kuljian Corporation,** engineers and constructors of Philadelphia, has been retained as the consulting firm for the development of the National Power System of Nicaragua, according to **Harry A. Kuljian,** president. The system is operated by the **Empresa Nacional de Luz y Fuerza** of Managua, an autonomous Government corporation. The Kuljian firm is now handling the planning for a new 30,000-KW power station in Managua.

Firm Reorganization . . . **George A. Heath,** engineer and manufacturers' agent of Mechanicsburg, Pa., has announced the introduction of **D. R. Crowley, Jr.,** an industrial engineer, into his business and the consequent change of the firm's name to **Heath-Crowley, Inc.**

Operational Expansion . . . **Fairchild Camera and Instrument Corporation,** Syosset, N. Y., has announced the establishment of a Nuclear Instrumentation Department to be headed by nucleonics expert **Dr. Harold Eugene DeBolt.** . . . The **Portland Cement Association,** Chicago, has added a new Manufacturing Process Department, according to **Dr. A. Allan Bates,** vice president for research and development. **Carl F. Clausen** has been appointed director of the new department. . . . **North American Aviation, Inc.,** Los Angeles, has established a separate Atomics International Division to handle all of the company's nuclear engineering and manufacturing operations, according to **J. H. Kindelberger,** chairman of the board. **Dr. Chauncey Starr** will head the new division. . . . **Arthur D. Little, Inc.,** Cambridge, Mass., industrial consulting research firm, has opened a new office in Los Angeles. **Dr. Benjamin S. Mesick,** a senior engineer with the firm, is directing the expanded operations in the Los Angeles area.

With Our Members . . .

Civic Service

Public Forum on Water Problems Is Sponsored by San José P.E.'s

As a public service for the citizens of Southern Alameda, Santa Clara, San Benito, and Santa Cruz Counties in California, the members of the San José Chapter of the CSPE recently sponsored a forum on the State's water problems. Held at San José State College on November 1, the meeting was open to the public and many prominent persons, including State Senators and Assemblymen, were in the audience.

Former Congressman Jack Z. Anderson of San Juan Bautista, who is active in civic groups seeking solutions to area water problems, served as moderator of the panel. Speakers taking part were: Congressman Clair Engle, Second District, Red Bluff, chairman of the Committee on Interior and Insular Affairs of the U. S. House of Representatives; State Senator Paul L. Byrne, Sixth District, Chico, a member of the State Joint Committee on Water Problems; Assemblyman Francis C. Lindsay, Sixth District, Loomis, chairman of the Committee for Conservation, Planning, and Public Works, and also a member of the State Joint Committee; C. H. Spencer, regional director, Region Two, Bureau of Reclamation; and William L. Berry, principal hydraulic engineer, State Division of Water Resources.

After the speakers had concluded, the discussion was opened to the public and questions were received from the floor.

Traver J. Smith is president of the San José Chapter. He was assisted in planning the meeting by members of the chapter's Water Resources Committee. Thelo A. Perrott is chairman of the committee, and the members are J. Winter Smith, E. O. Billwiller, Jack White, Paul Birmingham, and William Q. Wright.

"Future Engineers" Group Is Organized

Under the sponsorship of the Marion Chapter of the Ohio Society of Professional Engineers, the first chapter of a new organization—the Future Engineers of America—has been established at Harding High School in Marion. The first official meeting of the chapter was held recently with a large attendance of both students and sponsoring P.E.'s, as well as Marion public school officials and OSPE officers.

The purpose of the club as established at Harding High is declared to be: "to learn about the opportunities in engineering, to cultivate the qualities essential in a good engineer, to study the lives of great engineers, and to foster the development of student leadership."

Rex Kilbourn is president of the sponsoring Marion Chapter; Ellis Wilson is chairman of the Education Committee which provided the guidance in organizing the student group; and Joseph Petrich and Harold Hazelett are serving as club faculty advisers.

Arizona SPE Takes Part In Joint Meeting

The seventh annual joint meeting of Arizona engineering societies was held in Phoenix at the Hotel Westward Ho on November 18 and 19. The Arizona Society of Professional Engineers participated with local sections of the American Association of Engineers, the American Society of Civil Engineers, the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, the Illuminating Engineers Society, and the Institute of Radio Engineers.

Governor McFarland and Mayor Murphy of Phoenix were among the special guests at the annual engineers' dinner held on the 18th. The main speaker of the evening was Walter T. Lucking, president of the Arizona Public Service Company and a registered professional engineer.

Structural Design Book Published By McKaig

Applied Structural Design of Buildings is the title of a book by Thomas H. McKaig, which was published in November. Mr. McKaig, a consulting engineer with offices in Buffalo and Ithaca, New York, is a member of the New York State SPE and NSPE.

The book was developed as a result of Mr. McKaig's teaching of refresher courses to engineers preparing for their licensing examination in structural design and includes much material that he stressed in his teaching.

Publisher of the book is the F. W. Dodge Corporation, 119 W. 40th Street, New York 18, N. Y.

. . . more news on page 37

A VISIT TO NEVADA—The photograph at the right was made during a recent visit of NSPE's executive director, Paul H. Robbins, to Nevada. Attending a meeting of the Nevada Society of Professional Engineers at the Thunderbird Hotel in Las Vegas, Mr. Robbins (second from left) looks over the conference program with prominent Nevada P.E.'s Richard C. Barger, president of the Nevada Society (extreme left); Sidney J. McCarrol, president of the Southern Nevada Chapter; and Oscar J. Scherer, the NSPE national director representing the Nevada group.

Mr. Robbins' visit was a part of an extensive western tour he recently completed to bring the latest information on National Society activities to affiliated western state societies and chapters.

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N. J. Land Surveyors Hold Fall Conference

The annual Fall Conference sponsored by the Land Surveyors Division of the New Jersey Society of Professional Engineers was held at Princeton University, Princeton, N. J., on November 5. Robert McEldowney, Jr., chairman of the Land Surveyors Division, presided at the day-long event that attracted both surveyors and engineers from throughout the state.

Engineering Dean Joseph C. Elgin of Princeton gave a welcoming address to those who attended, and Merton S. Adams, NJSPE president, brought official greetings from the State Society.

Architect Speaks Before Indiana P.E. Group

Lloyd V. Moser, an architect, a member of the Lafayette firm of Walter Scholar and Associates, was the guest speaker at the November 10th dinner meeting of the Lafayette Chapter of the Indiana SPE. His subject was *Architecture and the Engineer.*

Award For Teachers

Plans are under way to give recognition to the outstanding high school science teachers in Wisconsin, as part of the WSPE's effort to encourage the study of engineering and scientific subjects. John Gammell of Milwaukee heads the Awards Committee which is surveying the situation.

. . . more news on page 39

CONGRESSIONAL GUEST — The Honorable Melvin Price (second from right in the photo), United States Representative from the 24th Illinois District, was the guest speaker at a recent banquet of the St. Clair Chapter of the Illinois SPE. (See story, *American Engineer*, November, p. 41.) Pictured with Congressman Price are: Dwain M. Wallace, president, Illinois SPE; Raymond G. Brichler, past president, ISPE, and program chairman for the meeting; and Loren M. Krause, president, St. Clair Chapter.

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Restricted to Registered Professional Engineers . . . Directory Continued on Next Page

Maumee Valley P.E.'s Meet With AIEE Group

Members of the Maumee Valley Chapter of the Ohio Society of Professional Engineers held a joint meeting late in October with the members of the local section of the American Institute of Electric Engineers. C. W. Schem of Sverdrup and Parcel, Inc., St. Louis, was the featured speaker for the event, discussing *Unity in Professional Engineering*. The meeting was held at Clemans Restaurant in Lima, Ohio.

At their November 18th meeting, the members of the Maumee P.E. group played hosts to fifty-five newly-registered engineers and engineers-in-training. Certificates were presented to the new registrants.

Members of the Ohio Northern, Lake Erie, and Toledo Chapters also were present.

Certificate Ceremony In Philadelphia

The November meeting of the Philadelphia Chapter of the Pennsylvania SPE featured the presentation of license certificates to the new engineering registrants of the area. Francis S. Friel, a member of the Pennsylvania Registration Board and of the Philadelphia Chapter, presented the certificates, assisted by Miss Rebecca Nickles, secretary of the Board.

Mr. Friel, who is president of the American Institute of Consulting Engineers, also delivered the address of the evening.

Plans are now being made by the chapter for the holding of the annual "Presidents' Night" banquet in January.

. . . more news on page 40

LEADERSHIP HONORED — In the photo, Dr. Harry S. Rogers (left), president of the Polytechnic Institute of Brooklyn, receives the Annual Award of the New York Chapter, NYSSPE, in recognition of his professional leadership. Frederick H. Zurmuhlen, New York City Commissioner of Public Works, is shown making the presentation.

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VSPE Annual Meeting Is Reported

The members of the Virginia Society of Professional Engineers held their annual meeting recently at the Hotel Roanoke in Roanoke, Virginia. NSPE President Allison C. Neff was one of the principal speakers at the meeting; others were Robert Patterson, Jr., counsel for the Associated General Contractors, and Dr. Marshall Fishwick of Washington and Lee University.

Chief action taken by the Virginia P.E.'s was the approval of a resolution favoring salary increases for the teaching personnel in Virginia engineering schools and another advocating the establishment of a statewide "career day" in the high schools. They also offered recommendations as to the minimum hours of training that should be required of high school science teachers.

Officers of the VSPE installed during the meeting were: G. H. Ruston of Roanoke, president; Fred Wilmer of Richmond, first vice president; and L. B. Griffith of Arlington, second vice president. James J. Corbalis, Jr., of Alexandria is the immediate past president of the state society, while John B. McGaughy of Norfolk is national director.

Richmond Chapter Holds Annual Meeting

The seventh annual meeting of the Richmond Chapter of the Virginia SPE was held at the William Byrd Hotel on November 3. The meeting featured the introduction of new officers and the reading of the annual reports of the various chapter committees.

A professional program was also presented featuring a panel of prominent engineering speakers. They included Professor Russell B. Allen of the University of Maryland, treasurer of the National Society; Llewellyn B. Griffith, Sr., Arlington, Virginia, consulting engineer and vice president of the VSPE; and Fred P. Wilmer of Richmond, vice president of Williamson & Wilmer, Inc., and a past president and director of the VSPE. The speakers, who outlined the meaning of the professional society and its services, also answered questions submitted by the engineers in attendance at the event.

Engineer Training Is Discussed

Walter White of the Stockham Valve & Fitting Company, Birmingham, was the guest speaker at a recent meeting of the Birmingham District Chapter of the Alabama SPE. Mr. White explained the training program for young engineers working for his firm.

The meeting was held at the Bankhead Hotel in Birmingham.

Aviation, Atomic Energy Are Lecture Topics

The Capital Chapter of the Illinois Society of Professional Engineers has reported two recent meetings of particular noteworthiness.

Late in October, the members met at the Elks Club in Springfield for a dinner meeting at which the guest speaker was Leslie A. Bryan, director of the Institute of Aviation at the University of Illinois. Mr. Bryan spoke on the subject, *The Last—and the Next—Fifty Years of Aviation.*

The November 15th meeting of the P.E. group was marked by an address on the development of atomic power. The lecturer was Dr. Rogers, the assistant director of the Argonne Atomic Laboratory.

Engineers' Week To Stress TV, Radio

"Early bird" chapters are already lining up public service time on radio and television stations for programs and spot announcements during the 1956 National Engineers' Week.

Letters received by the National Society headquarters indicate that NSPE affiliates will use more radio and TV time this year than ever before.

In an effort to help publicize these programs the AMERICAN ENGINEER will publish a listing of them in the January and February issues. The listing will be under the heading of "Engineers on the Air."

Each program will be listed by city, station, date, and time. Chapter Engineers' Week chairmen are urged to send any definite information on radio or TV program schedules to the National Society.

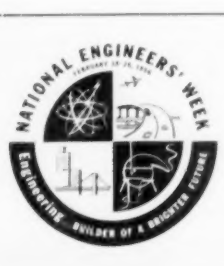
In commenting on the use of radio and TV programs, National Engineers' Week Chairman Anatole R. Gruehr declared that " . . . Chapters should make every effort to publicize well in advance any radio and TV programs that may be obtained for the Week."

Mr. Gruehr also emphasized that the chapters should plan their programs around the theme of the 1956 Engineers' Week, "Engineering—Builder of a Brighter Future."

In other developments concerning the Week, the National Society has had requests for hundreds of copies of the booklet "The Engineers' Week Story." Many chapter officials have requested the booklets for distribution to local industrial firms. An ample supply of the booklets is still available.

A complete selection of promotional aids for National Engineers' Week is now available from the National Society. Order forms listing the aids suitable for use by industrial firms are also available.

(See the full-page advertisement in this issue describing the TV films, radio tape recordings, and other promotional aids for the 1956 Week.)



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The Borough of Madison, New Jersey is seeking applicants for the position of borough engineer.
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We are looking for an executive-type man capable of administering and supervising all of the Borough's Engineering, Public Works, Electric and Water Utilities.
Madison is a high class all-residential suburban community of approximately 14,000 population located in the metropolitan New York area.
Interested persons meeting the requirements should apply in writing stating qualifications, experience, references, age and other personal history.
Arrangements can be made for personal interview. All communications should be addressed to:

Councilman R. D. Knapp
4 Redmond Drive
Madison, N. J.

Positions Wanted

STATIONS CONSTRUCTION, Elec. Engr., BSEE 1938, EE 1944, 39, P.E. 20 yrs. expr. and registration certified by Natl. Bu. Engr. Registration; on large (200,000 KW-up) thermal stations elect. const. supv. in USA—including two years in Asia. Widely traveled Europe, Asia, North America. Languages: English; French. Lt. Commander, CEC. Desire exceptional challenge domestic or foreign. Fred Mueller, P. O. Box 524, Adrian, Missouri.

PROFESSORSHIP or headship in civil engineering wanted by professionally active registered engineer with Ph.D. and research, field, office, and professorial experience. Box W-1102, AMERICAN ENGINEER.

STRUCTURAL ENGINEERS
BRIDGE DESIGNERS

Excellent opportunity for Structural Engineers experienced in design of structural steel or reinforced concrete, who desire to work with an established organization on large, long-term expressway programs. Recent graduates and detail draftsmen accepted. Pleasant living conditions in Harrisburg, Pennsylvania. Positions also available in Pittsburgh, Pa., and Florida. Insurance, pension and bonus plans reward service.
Send complete outline of experience, date available and salary desired in first letter to:

GANNETT FLEMING CORDDRY & CARPENTER, INC.
Box 366, Harrisburg, Pa.

STAFF ENGINEER

A nationally known manufacturer desires to employ recent mechanical or industrial engineering graduate for position of staff engineer in one of its tin can plants located in eastern Ohio. After training, should be able to take over all plant engineering functions. Must be production-minded as well as having supervisory ability. Tin can experience desired but not necessary. State age, education, experience, salary desired and other information.

Address Box A-1101
AMERICAN ENGINEER

Books

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The only illustrated guide to the widely accepted Standard ASA A40.8 National Plumbing Code.

An invaluable aid in your plumbing design.

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Send me _____ copies of "National Plumbing Code Illustrated" @ $4.00 per copy.
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Alabama Society of Professional Engineers—Annual meeting, December 10, 1955, Tutwiler Hotel, Birmingham, Alabama.

Idaho Society of Professional Engineers—Annual Meeting, January 20-21, 1956, Boise Hotel, Boise, Idaho.

Kansas Engineering Society—Annual Meeting, January 20-21, 1956, Baker Hotel, Hutchinson, Kansas.

Texas Society of Professional Engineers—Annual Meeting, January 25-27, 1956, Edson Hotel, Beaumont, Texas.

Wisconsin Society of Professional Engineers—Annual Meeting, January 26-28, 1956, Schroeder Hotel, Milwaukee, Wisconsin.

NSPE Spring Meeting—February 17, and 18, 1956, Mayflower Hotel, Washington, D. C.

Minnesota Society of Professional Engineers—Annual Meeting, February 22-24, 1956, Nicollet Hotel, Minneapolis, Minnesota.

New Mexico Society of Professional Engineers—Annual Meeting, February 24-25, 1956, Alvarado Hotel, Albuquerque, New Mexico.

Oklahoma Society of Professional Engineers—Annual Meeting, February 24-25, 1956, Tulsa Hotel, Tulsa, Oklahoma.

Tennessee Society of Professional Engineers—Annual Meeting, February 24-25, 1956, Andrew Johnson Hotel, Knoxville, Tennessee.

Georgia Society of Professional Engineers—Annual Meeting, February 25, 1956, Dinkler Plaza Hotel, Atlanta, Georgia.

Sanitary Engineers Meet In Washington

The first formal meeting of the recently-organized Conference of Federal Sanitary Engineers was held in Washington, D.C., on November 9, in conjunction with a meeting of the Sanitary Engineering Section of the Association of Military Surgeons of the United States. Presiding was M. D. Hollis, Assistant Surgeon General and Chief Sanitary Engineer, U. S. Public Health Service.

NSPE Executive Director Paul H. Robbins was one of the featured speakers, addressing the group on the subject, *Relationships of Professional Registration of Sanitary Engineers and the Federal Services.*

Paul Reed, editor in the Sanitary Engineering Division, American Society of Civil Engineers, and Lt. Col. Alvin F. Meyer, Jr., U.S.A.F., of the Strategic Command Headquarters, Omaha, Nebraska, also gave talks before the meeting; while a panel discussion on the subject, *Meeting Staffing Needs in New Fields*, completed the day's program. E. C. Anderson of the U. S. Public Health Service, Major Ralph F. Thompson of the Office of the Surgeon General, U. S. Air Force, and Captain Thomas R. Ostrom of the Army Chemical Center were participants in the panel.

The newly-formed Conference is dedicated to the furthering of the professional development and stature of sanitary and industrial hygiene engineers in the various departments of the Federal Government.

Highway Groups Merge In Minnesota

A. C. Godward of Minneapolis, president of the Hennepin County Good Roads Association and a well-known member of NSPE, has been elected temporary chairman of a committee which will act to put into effect the agreed-upon merger of the Minnesota Good Roads Association and the Minnesota Highway Federation. The purpose of the merger is to correlate the efforts of the two groups into a united front to expedite progress toward better roads for the State of Minnesota.

Godward, also known as a veteran city-planner, has recently resigned as executive director of the Minneapolis Housing and Redevelopment Authority, but has agreed to be "available indefinitely" as a consultant to the Authority. S. L. Stolte, a former president of NSPE, is chairman of the Authority.

Consulting

(*Continued from page 24*)

practice is far from being ethical. Everyone suffers from it, including the engineer and the client.

There was once an engineer in this region who prepared preliminary feasibility reports on a contingent basis, but he tied up his client in an agreement for the future work. This procedure appealed to a client, but the engineer was left "holding the bag" in a great many cases.

THE consulting engineer is entrusted with the design, supervision of construction or manufacture of projects which involve large sums of money. This is a great trust which is imposed upon the consultant, and he should meet this responsibility not only from the design and construction viewpoint, but also in the matter of ethics. Engineering services are professional in character. The engineer should be employed with that understanding.

After thirty-three years in the consulting engineering field, the author has concluded that an independent consultant can make a good living at engineering provided he follows the ethical principles laid down in the Canons and Codes of Ethics and also if he gives his client a little more engineering service than is normally required of him and for which he is paid. His fee should be based on the schedules of fees of our national engineering societies.

In the preparation of this discussion, the author gives due credit for his utilization of statements and excerpts from the publications of the American Society of Civil Engineers, the American Institute of Consulting Engineers and the National Society of Professional Engineers; and also for the use of information contained in the Canons and Codes of Ethics of the Engineers' Council for Professional Development and our national engineering societies.— ***End.***

About the Author . . .

Francis S. Friel

Francis S. Friel, a leading East Coast civil engineer and consultant, is president of the Philadelphia firm of Albright & Friel, Inc. and also of the American Institute of Consulting Engineers. He is a graduate of the Drexel Institute of Technology, a member of Tau Beta Pi, and is registered in Pennsylvania, New York, New Jersey, Maryland, Delaware, Virginia, West Virginia, and North Carolina.

He has been in private practice since 1922, first with the firm of Albright & Mebus; and since 1931, as president of Albright & Friel. He served with the U. S. Army Corps of Engineers during World War I; and he also did engineering work with the City of Philadelphia and the State Department of Health before entering the consulting field.

Projects in which he has been engaged include the desilting of the Schuylkill River, the setting up of new water supply systems for Chester, Pa., and Winston-Salem, N. C., and many others. During World War II he worked on numerous military installations, including the Aberdeen, Md., Proving Grounds.

Mr. Friel is a member of NSPE and many other technical and professional groups. He has most recently been elected president of the Pennsylvania Section of the American Water Works Association.

...NEW LITERATURE...

To help the offering firms determine which literature you require, when requesting an item, be sure to list all specifications shown . . . and say you saw it in the AMERICAN ENGINEER.

ALUMINUM PIPE—For conveying everything from air to acid—is thoroughly described in a new 18-page booklet published by Aluminum Company of America. Entitled "Aluminum Pipe and Fittings", the booklet presents the product's characteristics and advantages for each of its major fields of application. Specifications are provided, along with a description of appropriate fittings and methods of installation. Describes process industry applications of aluminum pipe and its advantages for that type of service. Similar treatment is accorded other fields of use, including pipelines, portable piping, and structural piping. A series of tables and graphs, providing extensive dimensional and performance data, completes the book. Tables include standard dimensions and weights for aluminum pipe, standard dimensional tolerances, data on spacing of supports, and loss of head for flow of water in pipe. Copies of "Aluminum Pipe and Fittings" are available from Aluminum Company of America, 770 Alcoa Bldg., Pittsburgh 19, Pa.

—AE—

AIR POWER DEVICES—The Bellows Co. announces Bulletin ML-3, illustrating and describing "Controlled-Air-Power" Devices. This 8-page book contains full color illustrations of The Bellows Air Motor and its interchangeable Valves as well as various typical application photos. Also, illustrations and descriptions of such standard items as Drill Press Feeds, Vises, Hydro-Checks, Rotary Feed and Index Tables, Self Contained Drilling Units, Valves and Cylinders, in the complete line of Bellows Packaged "Controlled-Air-Power" Devices. Send requests for this free bulletin to J. G. McComb, The Bellows Company, 222 W. Market Street, Akron, Ohio.

—AE—

INSTRUMENTATION—"Application of Principles of Instrumentation to Liquid and Dry Feeders" is the title of an eight-page preprint of a paper by Paul A. Coffman and issued by Omega Machine Company, division of B-I-F Industries, Inc. This preprint, presented at the 10th Annual Instrument-Automation Conference of the ISA, contains 11 flow-parts diagrams, and is part one on "Controllers". Purpose of this paper is to provide a basic knowledge of the application of instrument principles to gravimetric feeders, especially the function of the controller in its various forms. For your free copy of Preprint B-I-F-M65 write Omega Machine Company, 345 Harris Avenue, Providence, R. I.

—AE—

METAL LATH—Technical Bulletin No. 15, entitled "Hollow Partitions with Channel Studs", is now being issued by the Metal Lath Manufacturers Association. Descriptive material regarding the uses for these partitions is followed by complete specifications. Allowable partition heights for various partition thicknesses are given together with fire resistive ratings. Details of construction show various buck installations and methods of stud anchorage. Request from Metal Lath Manufacturers Association, Engineers Building, Cleveland 14, Ohio.

JACKS—A new Catalog, Number 555, has just been issued by Star Jack Co., Inc., 36 pages and cover, it is entitled, "Hydraulic and Air Components by Star Jack." Features specifications and applications of pumps, cylinders, jacks, braces and other units. Catalog 555 is available upon request from Star Jack Co., Inc., 420 Lexington Ave., New York 17, N. Y.

—AE—

RUBBER—Specifications and descriptions of sixty-eight different rubber hose for every industrial and agricultural use are presented in the new eight-page catalog digest by Industrial Rubber Division of Thermoid Company, Trenton, N. J. In addition, the brochure contains data on nine types of conveyor belts, seven types of flat power transmission belting, multiple and fractional horsepower V-belts, chute lining, rubber sheet packing and industrial friction materials. Twenty-three cutaway photographs show hose, coupling and belt construction. Request from above.

—AE—

COUPLINGS — American Flexible Coupling Company, affiliate of J. A. Zurn Mfg. Co., is distributing a new free booklet, "Amerigear Couplings . . . In Action" which contains a number of case histories of power transmission problems which were solved by the company's unique coupling. Case histories deal particularly with Amerigear Couplings in heavy mill service, high-speed turbines, hydraulic presses, 'round-the-clock power supply, aircraft power drives, rugged marine service and other applications. Copies of the booklet are available from American Flexible Coupling Company, at 1801 Pittsburgh Avenue, Erie 1, Pa.

—AE—

COMPRESSED AIR—The R. P. Adams Company, 251 E. Park Drive, Buffalo 17, N. Y., has published a new 12-page Bulletin 711 on Aftercoolers and Separators for compressed air systems. Written to help top management, production heads and operating personnel minimize the hidden costs of compressed air systems, this brochure is available on request from James C. Ritter, R. P. Adams Company, Inc., 225 E. Park Drive, Buffalo 17, N. Y.

—AE—

WIRE—"How Wire Construction Reduces Costs", showing the use of wire in improved product design, is a study of 36 illustrated case histories compiled by E. H. Titchener & Company. The new 11-page booklet covers a wide application range, including motor mounts, fan guards, furniture, building specialties, and television components. Descriptions of each before-and-after picture point up cost cuts in material, production, and tooling; reduced weight, simplified design, improved appearance, and noise and vibration reduction. Address requests on company letterhead, with title, to E. H. Titchener & Company, 67 Clinton Street, Binghamton, New York.

CONCRETE—Owners' reports on the present day condition of concrete produced with Pozzolith, in structures ranging in age from 14 to 19 years, are contained in a new Water and Sewage Works 20-page illustrated booklet just published by The Master Builders Co. It is pointed out in the booklet that concrete in the water and sewage works field is exposed to unusually severe conditions: weathering, freezing and thawing, saturation with water and chemical corrosion. For these reasons the reports of owners have unusual significance. The booklet discusses the importance of obtaining concrete of low permeability and great durability. Copy available from The Master Builders Co., Cleveland 3, Ohio.

—AE—

LIMIT SWITCHES—A new eight-page publication on lever and rotating cam type limit switches has been announced as available from the General Electric Company. Designated bulletin GEA-6131A, the two-color booklet contains application information, product feature, ratings, dimensions, and book prices. Included are lever-operated snap action, small oil-tight snap action, lever type-double circuit, rotating cam, and lever operated-slow make and break limit switches. Typical applications include control of machinery travel, machine tool valves, motor-operated doors and windows, safety interlocks on enclosing cases, automatic conveyors and balers, and battery truck lift platforms. Request from General Electric Company, Schenectady 5, New York.

—AE—

PACKAGED COOLERS—Bell & Gossett Company, manufacturers of hot water heating specialties, centrifugal pumps, heat exchangers, refrigeration components, air compressors, etc., has recently introduced a new line of package liquid coolers with many new and exclusive design features as outlined by the new catalog just released. The rating procedure, it was explained, is also unique. For the first time, cooling capacities are shown for a complete range of chilled water temperatures. Catalogs on B&G Packaged Liquid Coolers are available on request to the Company. A complete set of capacity ratings and specification sheets for all sizes is also available.

—AE—

NEEDLE ROLLERS—An illustrated 12 page catalog No. 61 on precision needle rollers complete with charts and formulae has been issued by The Kaydon Engineering Corp. Includes data on rollers never before published treating Kaydon precision rollers in automobile and truck transmissions, universal joints, clutches and steering gears. The catalog includes a listing of Kaydon standard sizes of needle rollers plus application data which includes capacity and design specifications for the needle rollers. Capacity factors and life factors for the rollers are included in charts, as are speed factors. General formulae for calculating needle roller applications are also included. Obtained from the Kaydon Engineering Corp., Muskegon, Michigan.

Spring Dedication For New NSPE Building

When the NSPE Spring Meeting is held in the Nation's Capital next February 17 and 18, one of the highlights will be the dedication of the new Headquarters Building now nearing competion at 2029 K Street, Northwest, in downtown Washington.

Invitations to attend the dedication ceremony, which will be held on the afternoon of February 17, are being extended to the Commissioners of the District of Columbia, Federal engineering officials, and prominent local engineers and civic leaders.

Financing for the impressive four-story building has been made possible by the NSPE members who subscribed to the issue of Building Fund Participation Certificates. Twenty-five thousand dollars' worth of certificates in $100 denominations are still available for those interested.

Another event scheduled for the 17th is the NSPE Spring Banquet at which many well-known engineering figures on the Washington and national scene will be guests. The name of the main speaker for the banquet is to be announced shortly.

National Society professional and business conferences will also be held on the 17th and 18th, and a special social program has been planned for the ladies. A meeting of the NSPE Executive Committee will be held on Thursday, February 16.

Among the items of business to be discussed by the directors will be final plans for the kick-off of National Engineers' Week, which is scheduled for February 19-25, 1956. It is anticipated that many of the speakers at the Spring Meeting will be giving a preview of the Engineers' Week theme, "Engineering—Builder of a Brighter Future."

Hosts for the two-day event are members of the District of Columbia Society of Professional Engineers who are now assisting with the planning.

Letters

(Continued from page 4)

scientists and engineers is certain to grow and is a far more fruitful and satisfactory method of support than any Federal subsidies.

L. A. DuBridge, President,
California Institute of
Technology,
Pasadena, Calif.

► **President DuBridge's letter will be the final comment to be published on the popular Emerson piece.—*Editor.***

Building Inspectors Must Accept Sealed Plans

New Jersey's Attorney General has ruled that building inspectors and other state officials must accept plans and specifications offered for filing if they bear the seal of either a licensed engineer or architect.

In an opinion to the State registration boards for engineers and architects, the Attorney General said his ruling followed inquiries as to whether the officials may refuse to accept the plans if it is believed that the work shown on the plans indicated that the preparation constituted illegal practice of architecture by an engineer, or illegal practice of engineering by an architect.

After quoting the applicable state laws, the ruling held: "The municipal building inspector or the State official to whom the plans are submitted for filing must so recognize them. It is not his function to determine whether plans which bear the seal of a licensed engineer indicate that there has been a violation . . . prohibiting the unlicensed practice of architecture, nor whether plans which bear the seal of a licensed architect indicate that there has been a violation (of the law) prohibiting the unlicensed practice of engineering."

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NEW Processes . . .

Six-direction Driver-less Car Improves Varnish Impregnation

Specialty transformers made here are taking a longer lease on life, due to a new completely automatic method of varnish impregnation, according to executives of the General Electric Company's Specialty Transformer Department who pointed out that the new system thoroughly impregnates the entire transformer coil with varnish, greatly improving dielectric strength and increasing transformer life by reducing burnouts. Pressure, as well as heat, forces the varnish through transformer coil and laminations so that every area is protected.

Key to the operation is a driver-less car, which is remotely controlled for six-direction motion. The car takes pallets of transformers into and out of a preheat oven, then transfers them into the pressure-vacuum impregnator.

After the transformers have been treated with varnish, the car is automatically retracted, and then unloaded.

The new system was built and installed by the Equipment Division of Blaw-Knox Co., Pittsburgh, Pa.

Oxygen Converter Process For Steelmaking

Essentially, the Oxygen Converter Process consists of introducing a stream of high-velocity, high-purity oxygen to the surface of a charge of molten pig iron, iron ore, and limestone. The result is a high-quality, low-cost heat of steel produced at the rate of nearly a ton a minute. Construction cost of facilities is also low, less than half that of open hearth furnaces.

While having revolutionary implications for the steel industry, the process itself is the result of many years of research and experimentation, stretching back for almost a century. It has been commercially applied for less than three years, however, and even more recently in the United States.

As now developed, the new method appears to be an attractive complement to the open hearth process, and not a substitute.

Exclusive licensing rights to the process for the United States are held by Kaiser Engineers, a division of the Henry J. Kaiser Company.

Powder Fluidizer For Plastic Coatings

Announcement of a revolutionary new process for providing corrosion-resistant coatings of polyethylenes, polyfluorocarbons, nylon and other plastics on metallic and dissimilar plastic molded targets, was announced today by the American Agile Corporation, Maple Heights (Cleveland), Ohio.

Until this time, certain targets could be coated with polyethylene, to provide corrosion-resistant surfaces, by using special spraying equipment. However, many additional targets could not be sprayed because of their small size and/or irregular shapes.

The new process, known as the fluidized-coating process, will be displayed for the first time at the 25th National Chemical Show, December 5 to 9, in Philadelphia.

According to Dr. J. A. Neumann, Agile president and director of research, "the fluidized-coating process, a brand new concept in coating techniques, fills the last major gap in the anti-corrosion coating field. It will enable industry to apply on-the-spot corrosion protection when and where it is needed, at an exceptionally low cost, and in 50 per cent less time than was required with spraying."

The process involves the use of a Powder Fluidizer, a compact unit consisting of a specially designed gas distribution system which maintains the plastic powder in a turbulent dense fluid state. The appearance of the fluidized bed closely resembles that of a boiling liquid.

The fluidized-coating process provides a uniform coating up to 3/16" thick. The target to be coated is first pre-heated to predetermined temperature, then immersed in the fluidized coating powder for from 10 to 15 seconds. It is then replaced in the oven, and allowed to cure for a short period.

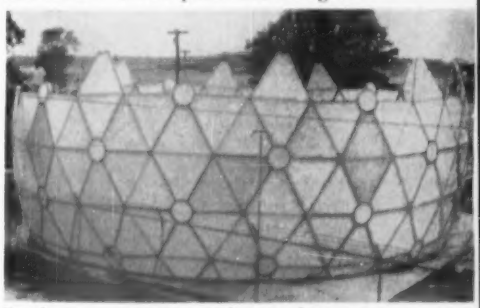
Dr. Neumann added that "expected additional applications for the new process include the coating of interior surfaces of such items as pipe which require corrosion-resistant protection but which must withstand pressures beyond the capacity of polyethylene pipe; flasks and containers with small-diameter neck openings, yet whose interiors require corrosion protection; flat but highly irregular shapes such as propellers, mixing blades, etc.

Military To Use Geodesic Plastic Dome For Shelter

A four-story high, 55 ft. diameter sphere made of reinforced plastic materials, completed by Lunn Laminates, Inc. of Huntington Station, L. I., N. Y., is the world's largest rigid plastic structure manufactured to date, according to the statement issued by H. T. Douglas, Executive Vice President.

The clearspan three-quarter sphere identified as a "Geodesic structure" by its inventor, Dr. Buckminster Fuller, President of Geodesics, Inc., Cambridge, Mass., will be used as a shelter for military purposes. Location data and specific application are not released.

The 55 ft. Geodesic plastic sphere, was molded of 363 parts by Lunn Laminates. These parts are designed



Geodesic structure, to be used as a military shelter, being assembled

in circles and polygons for structural strength and gasketed with neoprene. The durability of the fiber glass laminated material makes it impervious to extreme changes in temperature. The Geodesic plastic dome can withstand wind velocity up to 200 mph.

In weight comparison, this six-ton plastic structure is much lighter than a conventional dome. A crew of eight men easily assembled the dome in a total of 283 hours although none of the men had ever seen a structure of this kind before.

Lunn Laminates, Inc., has volume produced the body parts for Chevrolet's Corvette and Kaiser-Willys' Darrin through their accelerated bag molding techniques; and manufactured the first all-plastic cab and truck bodies for United Parcel Service's delivery fleet; as well as baby carriages, caskets, chairs and many other consumer, industrial and military products.

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ILLUMINATES ENTIRE WORKING AREA — item 1

A new lamp has been perfected for lighting drafting and drawing boards which illuminates the entire working area with 100 foot candles. Called Draft-o-Lamp, this lamp is said to provide perfect, shadowless light even on the corners of the drafting board. Four feet long, the lamp is designed for use with two 40 watt fluorescent lamps. Adjustable for height. Throws a shadowless light, free from glare. Absence of heat radiation makes for comfortable working conditions.

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COMBINED SHEATHING AND SHINGLING — item 2

Kraus Shingle Panel Corp. announces the Kraus Shingle Panel which is said to cut sidewall erection in half by combining sheathing and shingles in one panel. Two types available. Both constructed of double coursed, edge grain No. 1 Red Cedar Shingles. Type "M" panels have as a core a heavy insulating sheathing. Type "T" panels have a solid gypsum rock fireproof core ½" thick. All panels are in standard size 14" x 96" ready for nailing. Both types are easily cut by hand or power saws. Corners can be finished with shingles, metal corners or corner boards.

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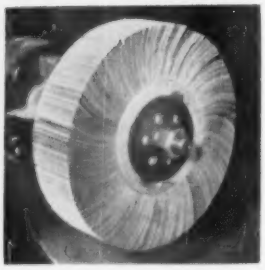

A new device for polishing metal called the "PG" wheel (polishing and grinding wheel) has been developed by Minnesota Mining and Manufacturing Co. It consists of hundreds of pieces of cloth coated abrasives factory-formed into a wheel that can be used on rotary or straight line automatics, or on standard lathes for hand operation. Abrading-polishing action and the wheel's ability to conform enable it to remove mild draw marks in the same process in which it generates a buff-type finish.

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HYDROGEN-DETERMINATOR — item 4

Ledoux & Company announces its new Hydrogen-Determinator. Company states it reduces the time per determination to 20 minutes in a wide variety of metals, including Titanium, Zirconium, Cerium, Tantalum, Niobium, Molybdenum, Tungsten, Nickel, Cobalt and their alloys. It determines Hydrogen in concentrations as low as .003% and as high as those occurring in metal hydrides. No vacuum is required. The method is reproducible and accurate. A large sample (up to 10 grams) can be taken, giving better representation in unhomogeneous materials. Can also be used to determine carbon and sulfur.

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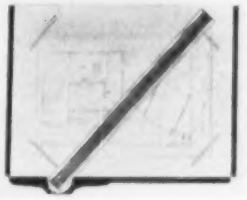
BEVELLED EDGE INSULATION WRAP — item 5

Kwikwrap is a new insulation wrap for preventing condensation-dripping from cold pipes. The unique feature of Kwikwrap is its shape and its method of application. It is extruded, with bevelled sides. This permits longitudinal application to the pipe. The 30' strip of Kwikwrap is cross cut each 24" so it can be easily separated in 2' lengths for application. It is held along the length of pipe on the underside and then pressed up around the pipe (or tubing); the self-sealing bevelled edges are pressed together to form an all-around uniform covering.

This column describes new products of general interest to professional engineers. For further information, fill in the coupon provided and mail to the AMERICAN ENGINEER.

DRAWING BOARD, T-SQUARE, PROTRACTOR — item 6

Drafteze is a combination of a unique drawing board, so precision engineered as to make possible the use of a new instrument, a patented angular T square and a protractor. Angular drawings are simple, just determine the proper angle desired and set indicator on protractor at the proper degree. If 90° angle is desired, set T square indicator at right angles and let it lock into position.



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PORTABLE HEAT SOURCE — item 7

The Lennox Furnace Company announces the Lennox Heat Wagon. Anytime heat is needed in a building—for human comfort, for drying purposes, for keeping power machinery or other equipment warmed up and ready to go—this heater can be used to supply clean, warm air. It's light enough to be carried upstairs by two men for upper floor heating, and rolls through standard 30 inch doorways. Weight is so distributed that it balances like a wheelbarrow for pushing. Plugs into standard 110-V outlet. The 19 gallons self contained oil supply is enough for top output for 12 hours of continuous operation. Capacity is over 200,000 BTU per hour.

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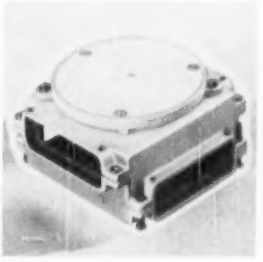
TWO-LEVEL WIRING SYSTEM — item 8

A new two-level steel underfloor wiring system designed for commercial, industrial, and institutional buildings has been announced by General Electric's Conduit Products Department. Consists of two levels of steel ducts with necessary fittings and is designed to feed and distribute power, telephone, signal and auxiliary systems. The lower level of duct is used to feed conductors from panel boxes to the upper level which in turn distributes conductors to the surface outlets. This two-level design makes possible a new flexibility in layout of underfloor systems.



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CONTROLS DUST, FUMES, ODORS — item 9

A special new dust control unit is said to remove microscopic solids, fumes and odors from exhaust gases at 99% efficiency. Can be used anywhere impurities are encountered of extremely low and even sub-micron size particles. Efficiency up to 99% has been obtained in test situations with dust loadings at five grains per cubic foot and 70% of the material below five-micron particle size. The Type A Hydro Precipitator Scrubber, a development of The Johnson-March Corp., collects dust by hydro-compressing exhaust gases through a system of multiple tubes into a water chamber. Comes in 15 sizes for capacities ranging between 500 cfm and 40,000 cfm.

AMERICAN ENGINEER — Dec., 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

Please send information on Item 9 to:

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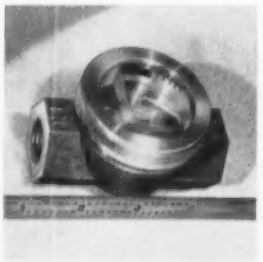
DIRECT READING FLOW RATE METER — item 10

A new Direct Reading Flow Rate Meter, Revere F-8110, providing visual flow rate indication in circulating, lubricating and fueling systems, is announced by Revere Corporation of America. The 1.5 pound unit is designed to cover a flow range of 7 to 70 GPH and to operate at temperatures of minus 65° to plus 160° F. The manufacturer states that the simply designed unit, which has only one moving part, is accurate to within plus or minus 2% of the specified flow rate and has a low pressure drop.



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New Streamliner 400 saves drafting time with duplicate originals

Last word in whiteprinters, the STREAMLINER *400 will produce easily, quickly and cheaply Ozalid duplicate originals of drawings, plans, designs, and sketches—save hours of tracing and repetitive copying.*

Ozalid duplicate originals are translucent prints, on which any changes, additions and deletions can be made without affecting the basic drawings. Additional prints can be made directly from these duplicate originals. They are used in thousands of architectural, engineering, design and production departments to speed the preparation of drawings for wiring, plumbing, air conditioning, for special installations, for fabricators and suppliers.

The STREAMLINER 400 will reproduce anything drawn, typed, printed or written on translucent materials—reports, specifications, drawings, materials lists, instruction sheets, bulletins, payroll sheets, cumulative records, etc. An Ozalid copy can be made in less than a minute, is delivered dry and ready for use, and costs less than 1½¢ a square foot.

The new model has synchronized printing and developing, handles sheet or roll stock up to 42" wide, prints at speeds up to 24 feet per minute. It is compact, easy to operate, requires minimum maintenance—and is low priced.

Ask the nearest Ozalid distributor *(see phone book)* how the STREAMLINER 400 can help you. Or write for information to 348 Ozaway, Johnson City, N. Y. In Canada, Hughes Owens Company, Ltd., Montreal.

OZALID—A Division of General Aniline & Film Corporation • *From Research to Reality!*

The new low priced Ozalid STREAMLINER *400 has synchronized printing and developing . . . produces perfect whiteprints for less than 1½ cents per square foot.*

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